

(FILE 'HOME' ENTERED AT 17:12:54 ON 04 AUG 2003)

FILE 'REGISTRY' ENTERED AT 17:13:01 ON 04 AUG 2003

L1 STRUCTURE UPLOADED  
L2 549 S L1 FULL

FILE 'CAPLUS' ENTERED AT 17:15:21 ON 04 AUG 2003

L3 269 S L2  
L4 1507622 S POLYMER OR COPOLYMER OR RESIN  
L5 5 S L3 AND L4  
L6 32083 S PHOTORESIST OR RESIST COMPOSITION

FILE 'REGISTRY' ENTERED AT 17:15:58 ON 04 AUG 2003

L7 SCREEN 2067  
L8 4 S L1  
L9 7 S POLY AND L2

FILE 'CAPLUS' ENTERED AT 17:17:36 ON 04 AUG 2003

L10 2 S L9  
L11 2 S L5 AND L6

FILE 'REGISTRY' ENTERED AT 17:19:59 ON 04 AUG 2003

FILE 'CAPLUS' ENTERED AT 17:20:15 ON 04 AUG 2003

L12 2 S L3 AND L6

FILE 'REGISTRY' ENTERED AT 17:20:33 ON 04 AUG 2003

L13 STRUCTURE UPLOADED  
L14 3053 S L13 FULL

FILE 'CAPLUS' ENTERED AT 17:21:21 ON 04 AUG 2003

L15 152 S L4 AND L14  
L16 89 S L6 AND L15

FILE 'REGISTRY' ENTERED AT 17:30:28 ON 04 AUG 2003

L17 STRUCTURE UPLOADED  
L18 126 S L17 FULL

FILE 'CAPLUS' ENTERED AT 17:31:11 ON 04 AUG 2003

L19 17 S L4 AND L18  
L20 8 S L6 AND L19

FILE 'REGISTRY' ENTERED AT 17:38:49 ON 04 AUG 2003

L21 STRUCTURE UPLOADED  
L22 651 S L21 FULL  
L23 STRUCTURE UPLOADED  
L24 STRUCTURE UPLOADED  
L25 1 S L23 FULL  
L26 126 S L24 FULL

FILE 'CAPLUS' ENTERED AT 17:40:23 ON 04 AUG 2003

L27 89 S (L22 OR L25 OR L26) AND L4 AND L6

=>

PGPUB-DOCUMENT-NUMBER: 20010038969

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20010038969 A1

TITLE: Novel polymers, resist compositions and patterning process

PUBLICATION-DATE: November 8, 2001

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Hatakeyama, Jun	Nakakubiki-gun		JP	
Watanabe, Jun	Nakakubiki-gun		JP	
Harada, Yuji	Nakakubiki-gun		JP	

APPL-NO: 09/ 783446

DATE FILED: February 15, 2001

## FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	DOC-ID	APPL-DATE
JP	2000-040190	2000JP-2000-040190	February 17, 2000
JP	2000-040193	2000JP-2000-040193	February 17, 2000

INT-CL: [07], G03F007/004, G03F007/38, G03C001/73, G03F007/20

US-CL-PUBLISHED: 430/270.1, 430/322, 430/330, 430/942, 430/296

US-CL-CURRENT: 430/270.1, 430/296, 430/322, 430/330, 430/942

## ABSTRACT:

Polymers comprising recurring units of fluorinated maleic anhydride and/or fluorinated maleimide are novel. Using the polymers, resist compositions featuring low absorption of F.sub.2 excimer laser light are obtained.

## BRIEF SUMMARY:

[0001] This invention relates to novel polymers useful as the base resin in

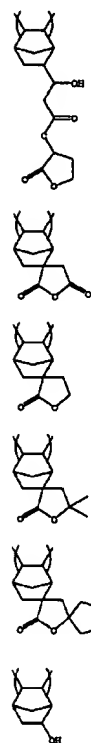
US 2001/0038969 A1

8

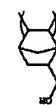
Nov. 8, 2001

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07-4



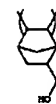
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07-13



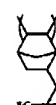
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07-7



07-14

07-4



07-15

07-9



07-16

07-10



07-17

07-11



US-PAT-NO: 6579658

DOCUMENT-IDENTIFIER: US 6579658 B2

TITLE: Polymers, resist compositions and patterning process

DATE-ISSUED: June 17, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hatakeyama, Jun	Nakakubiki-gun	N/A	N/A	JP
Watanabe, Jun	Nakakubiki-gun	N/A	N/A	JP
Harada, Yuji	Nakakubiki-gun	N/A	N/A	JP

## ASSIGNEE INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Shin-Etsu Chemical Co., Tokyo Ltd.		N/A	N/A	JP	03

APPL-NO: 09/ 783446

DATE FILED: February 15, 2001

## FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
JP	2000-040190	February 17, 2000
JP	2000-040193	February 17, 2000

INT-CL: [07] G03C001/492

US-CL-ISSUED: 430/270.1, 430/907, 430/322, 430/330, 526/248, 549/254

US-CL-CURRENT: 430/270.1, 430/322, 430/330, 430/907, 526/248, 549/254

FIELD-OF-SEARCH: 430/270.1; 430/905; 430/907; 430/322; 430/330; 526/248; 549/254; 549/62

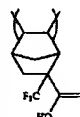
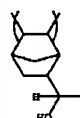
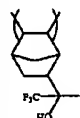
## REF-CITED:

U.S. PATENT DOCUMENTS

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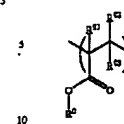


In one preferred embodiment, the inventive polymer includes recurring units "a" of the following general formula

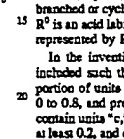
Details Text Image HTML Full

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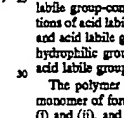
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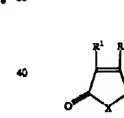
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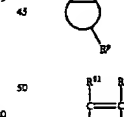
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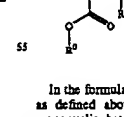
(1)-18



(1)-19



(1)-20



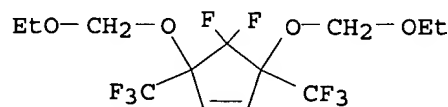
In the formulas,  $R^1$ ,  $R^2$ ,  $X$ ,  $R^3$ ,  $R^4$ ,  $R^5$ , and  $R^6$  are as defined above. The monomer of formula (ii) is a monocyclic, heterocyclic or bridged-ring hydrocarbon having an ethylene unsaturated bond.

In preparing copolymers of fluorinated maleic anhydride with cycloolefins as represented by formula (i) by polymerizing the essential monomers, there can be added a monomer having a substituent for improving adhesion, a monomer for improving dry etching resistance, and/or a monomer having

Details Text Image HTML Full

L5 ANSWER 1 OF 5 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:301117 CAPLUS  
 DN 138:304711  
 TI Novel fluoropolymer, resist compositions containing the same, and novel fluoromonomers  
 IN Araki, Takayuki; Ishikawa, Takuji; Koh, Meiten  
 PA Daikin Industries, Ltd., Japan  
 SO PCT Int. Appl., 153 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003031487	A1	20030417	WO 2002-JP10242	20021002
	W: JP, KR, US RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				
PRAI	JP 2001-307823	A	20011003		
	JP 2002-54964	A	20020228		
OS	MARPAT 138:304711				
AB	<p>The present invention relates to a fluorocopolymer having aliph. monocyclic structures in the backbone chain, as represented by the general formula (M1)(M2a)(N) wherein structural unit (M1) is a unit derived from an ethylenic monomer having two or three carbon atoms and at least one fluorine atom; structural unit (M2a) is at least one kind of unit represented by the general formula I and forming an aliph. monocyclic structure in the backbone chain; and structural unit (N) is a unit derived from a monomer copolymerizable with structural units (M1) and (M2a), which comprises 1 to 99 mol% of structural units (M1), 1 to 99 mol% of structural units (M2a) and 0 to 98 mol% of structural units (N) and has a no.-av. mol. wt. of 500 to 1,000,000. In the formula I, R1 is at least one group selected from among divalent hydrocarbon groups which each have one to eight ring-constituting carbon atoms and may be substituted with hydrocarbyl or fluoroalkyl, and divalent hydrocarbon groups which each have an ether linkage with the sum of ring-constituting carbon and oxygen atoms ranging from 2 to 8 and may be substituted with hydrocarbyl or fluoroalkyl; R2 is alkylene having one to three ring-constituting carbon atoms; R3 and R4 are each independently alkylene having one or two carbon atoms; and n1, n2, and n3 are each independently 0 or 1. This fluorocopolymer exhibits excellent dry etching resistance and transparency in the vacuum UV region. Thus, 3.4 g cyclopentene and 10.0 g tetrafluoroethylene were reacted in HCFC 141b contg. bis(4-tert-butylcyclohexyl) peroxydicarbonate to give a 50:50 mol% copolymer with Mn 5700.</p>				
IT	<p><b>509085-42-1P</b>          RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)          (intermediate in monomer prepn.; prepn. of fluoropolymers or fluoromonomers useful for photoresist compns.)</p>				
RN	509085-42-1 CAPLUS				
CN	Cyclopentene, 3,5-bis(ethoxymethoxy)-4,4-difluoro-3,5-bis(trifluoromethyl)-(9CI) (CA INDEX NAME)				

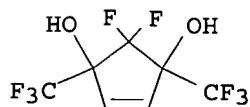


IT **509085-43-2P**  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (monomer; prepn. of fluoropolymers or fluoromonomers useful for

photoresist compns.)

RN 509085-43-2 CAPLUS

CN 4-Cyclopentene-1,3-diol, 2,2-difluoro-1,3-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



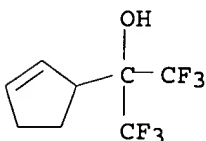
IT 509085-39-6P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(monomer; prepn. of fluoropolymers or fluoromonomers useful for photoresist compns.)

RN 509085-39-6 CAPLUS

CN 2-Cyclopentene-1-methanol, .alpha.,.alpha.-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



IT 509085-40-9P

RL: IMF (Industrial manufacture); PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(prepn. of fluoropolymers or fluoromonomers useful for photoresist compns.)

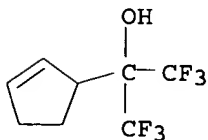
RN 509085-40-9 CAPLUS

CN 2-Cyclopentene-1-methanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 509085-39-6

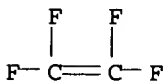
CMF C8 H8 F6 O



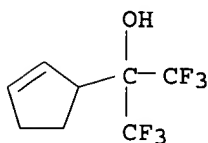
CM 2

CRN 116-14-3

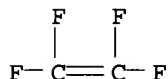
CMF C2 F4



IT 509085-40-9DP, hydrolyzed  
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (prepn. of fluoropolymers or fluoromonomers useful for photoresist compns.)  
 RN 509085-40-9 CAPLUS  
 CN 2-Cyclopentene-1-methanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with tetrafluoroethene (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 509085-39-6  
 CMF C8 H8 F6 O



CM 2  
 CRN 116-14-3  
 CMF C2 F4



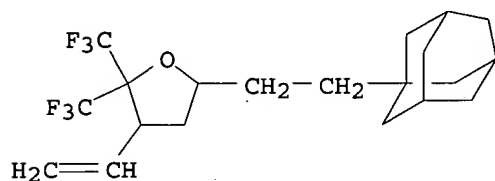
RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 2 OF 5 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2002:353506 CAPLUS  
 DN 136:377479  
 TI High-molecular compounds for photoresists, monomeric compounds, photosensitive resin compositions, method for forming patterns with the compositions, and process for production of electronic components  
 IN Shida, Naomi; Ushirogouchi, Toru; Naito, Takuya  
 PA Kabushiki Kaisha Toshiba, Japan  
 SO PCT Int. Appl., 321 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

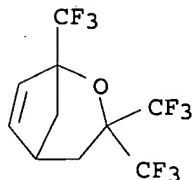
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002036646	A1	20020510	WO 2001-JP9567	20011031
	W: KR, US				
	JP 2002201219	A2	20020719	JP 2001-295012	20010926
PRAI	JP 2000-332358	A	20001031		
	JP 2001-295012	A	20010926		

OS MARPAT 136:377479  
 AB High-mol. compds. for photoresists, each having at least one skeleton represented by the general formula -RC(Rx1)2(ORx1), I, II, or III: -RC(Rx1)2(ORx1) I II III( R = alicyclic skeleton; Rx1= electron-attracting group, H, monovalent org. group). The compds. shows small absorption towards .ltoreq.160 nm light and provides the fine resist pattern of nanometer size and of the high etching resistance.

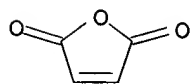
IT 424825-88-7P 424825-93-4P 424825-96-7P  
 424825-99-0P 424826-05-1P 424826-07-3P  
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material  
 use); PREP (Preparation); USES (Uses)  
 (high-mol. compds. for photoresists)  
 RN 424825-88-7 CAPLUS  
 CN 2,5-Furandione, polymer with 3-ethenyltetrahydro-5-(2-  
 tricyclo[3.3.1.1<sup>3,7</sup>]dec-1-ylethyl)-2,2-bis(trifluoromethyl)furan and  
 1,3,3-tris(trifluoromethyl)-2-oxabicyclo[3.2.1]oct-6-ene (9CI) (CA INDEX  
 NAME)  
 CM 1  
 CRN 424825-87-6  
 CMF C20 H26 F6 O



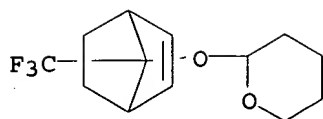
CM 2  
 CRN 424825-86-5  
 CMF C10 H7 F9 O



CM 3  
 CRN 108-31-6  
 CMF C4 H2 O3



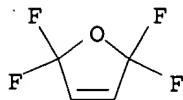
RN 424825-93-4 CAPLUS  
 CN 2H-Pyran, tetrahydro-2-[[7-(trifluoromethyl)bicyclo[2.2.1]hept-2-en-7-ylloxy]-, polymer with 2,2,5,5-tetrafluoro-2,5-dihydrofuran (9CI) (CA  
 INDEX NAME)  
 CM 1  
 CRN 424825-92-3  
 CMF C13 H17 F3 O2



CM 2

CRN 24565-48-8

CMF C4 H2 F4 O



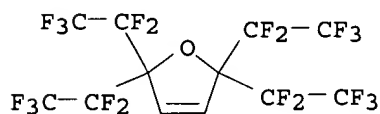
RN 424825-96-7 CAPLUS

CN Furan, 2,5-dihydro-2,2,5,5-tetrakis(pentafluoroethyl)-, polymer with  
1-[2,2,2-trifluoro-1-[(2-methoxyethoxy)methoxy]-1-(trifluoromethyl)ethyl]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 424825-95-6

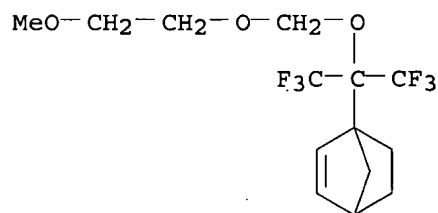
CMF C12 H2 F20 O



CM 2

CRN 424825-94-5

CMF C14 H18 F6 O3



RN 424825-99-0 CAPLUS

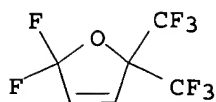
CN Furan, 2,2-difluoro-2,5-dihydro-5,5-bis(trifluoromethyl)-, polymer with  
1-[1-(1-butoxyethoxy)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 424825-98-9

CMF C6 H2 F8 O

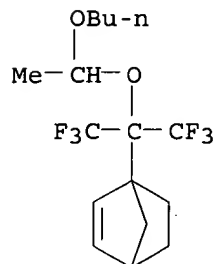




CM 2

CRN 424825-97-8

CMF C16 H22 F6 O2



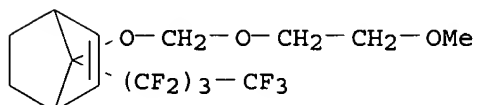
RN 424826-05-1 CAPLUS

CN 2,5-Furandione, polymer with 7-[(2-methoxyethoxy)methoxy]-7-(nonafluorobutyl)bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 424826-04-0

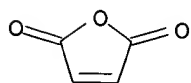
CMF C15 H17 F9 O3



CM 2

CRN 108-31-6

CMF C4 H2 O3



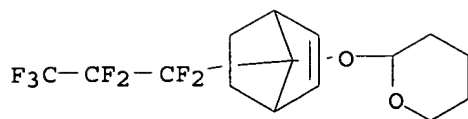
RN 424826-07-3 CAPLUS

CN 2H-Pyran, 2-[[7-(heptafluoropropyl)bicyclo[2.2.1]hept-2-en-7-yl]oxy]tetrahydro-, polymer with 2,5-dihydro-2,2,5,5-tetrakis(trifluoromethyl)furan (9CI) (CA INDEX NAME)

CM 1

CRN 424826-06-2

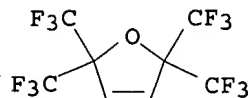
CMF C15 H17 F7 O2



CM 2

CRN 424825-90-1

CMF C8 H2 F12 O

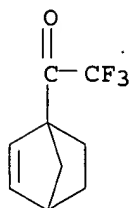


IT 424826-62-0

RL: RCT (Reactant); RACT (Reactant or reagent)  
(monomer of high-mol. compds. for photoresists)

RN 424826-62-0 CAPLUS

CN Ethanone, 1-bicyclo[2.2.1]hept-2-en-1-yl-2,2,2-trifluoro- (9CI) (CA INDEX NAME)



RE.CNT 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 3 OF 5 CAPLUS COPYRIGHT 2003 ACS on STN

AN 1994:81543 CAPLUS

DN 120:81543

TI Ion conductive **polymer** solid electrolytes

IN Armand, Michel; Sanchez, Jean Yves; Deroo, Daniel

PA Centre National de la Recherche Scientifique, Fr.; Hydro-Quebec

SO PCT Int. Appl., 22 pp.

CODEN: PIXXD2

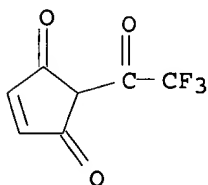
DT Patent

LA French

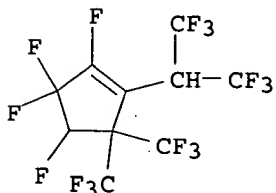
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9216028	A1	19920917	WO 1992-FR198	19920304
	W: CA, JP, US				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE				
	FR 2673769	A1	19920911	FR 1991-2715	19910307
	FR 2673769	B1	19930618		
	EP 531492	A1	19930317	EP 1992-907207	19920304
	EP 531492	B1	19951004		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, MC, NL, SE				
	JP 05506540	T2	19930922	JP 1992-506905	19920304
	JP 3429305	B2	20030722		

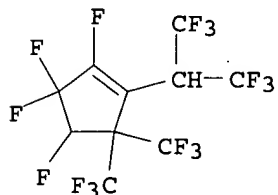
AT 128792 E 19951015 AT 1992-907207 19920304  
 US 5350646 A 19940927 US 1992-945639 19921106  
 PRAI FR 1991-2715 A 19910307  
 WO 1992-FR198 W 19920304  
 AB The electrolytes are a solid soln. of .gtoreq.1 salts in a **polymer** where the transport and mobility of a metal cation  $Mn^{+}$  with valence  $n=1-5$  is provided by .gtoreq.1 complex anion of formula  $[MZnYp]^{p-}$  formed between an anionic ligand  $Z^{-}$ , an anionic ligand  $Y^{-}$ , and the cation  $Mn^{+}$  where  $p=1-3$ . The salt is  $A(MxZzYy)$  where A is a cation of valence  $p=1$  or 2 and  $p=z+y-nx$ , permitting the coexistence of anions  $[MZnYp]^{p-}$  and  $[MZnYp+1]^{(p+1)-}$  or  $[MZn+1Yp]^{(p+1)-}$  or the neutral species  $MZn$ . Examples included poly(ethylene oxide) which was mixed in soln. with  $CF_3CO_2Cs$  and  $(CF_3CO_2)_2Ni$  forming a solid soln. contg. the complex  $Ni(CF_3CO_2)_3^{-}$ .  
 IT 151582-20-6D, metal complexes  
 RL: USES (Uses)  
 (polymers contg., as ionic conductive solid electrolytes)  
 RN 151582-20-6 CAPLUS  
 CN 4-Cyclopentene-1,3-dione, 2-(trifluoroacetyl)- (9CI) (CA INDEX NAME)



L5 ANSWER 4 OF 5 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1989:25185 CAPLUS  
 DN 110:25185  
 TI **Polymer** chemistry. Part 1. Model compounds related to hexafluoropropene-vinylidene fluoride elastomer  
 AU Apsey, G. C.; Chambers, R. D.; Salisbury, M. J.; Moggi, G.  
 CS Dep. Chem., Univ. Durham, Durham, DH1 3LE, UK  
 SO Journal of Fluorine Chemistry (1988), 40(2-3), 261-82  
 CODEN: JFLCAR; ISSN: 0022-1139  
 DT Journal  
 LA English  
 AB Model compds. related to the title rubber were synthesized from telomers  $(CF_3)_2CF(CH_2CF_2)_nI$ , by coupling and by fluorodeiodination reactions. These models, in reactions with bases, gave information relating to mechanisms of vulcanization of the **polymer** and indications of factors that limit its working life.  
 IT 116071-12-6P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of, as model for hexafluoropropene-vinylidene fluoride elastomer)  
 RN 116071-12-6 CAPLUS  
 CN Cyclopentene, 1,4,5,5-tetrafluoro-3,3-bis(trifluoromethyl)-2-[2,2,2-trifluoro-1-(trifluoromethyl)ethyl]- (9CI) (CA INDEX NAME)



L5 ANSWER 5 OF 5 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1988:493667 CAPLUS  
 DN 109:93667  
 TI Antimony pentafluoride in the synthesis of novel fluoroalkene derivatives and a novel approach to conjugated polymers  
 AU Chambers, Richard D.; Salisbury, Martin; Apsey, Glenn; Holmes, Thomas F.; Modena, Silvana  
 CS Dep. Chem., Univ. Sci. Lab., Durham, DH1 3LE, UK  
 SO Journal of the Chemical Society, Chemical Communications (1988), (10), 679-80  
 CODEN: JCCCCAT; ISSN: 0022-4936  
 DT Journal  
 LA English  
 AB SbF5-induced .beta.-eliminations of HF or HCl was remarkably effective in the prepn. of conjugated polymers from polyvinyl halides. When a thin film of poly(vinylidene fluoride) was exposed, under high vacuum, to SbF5 vapor at room temp., the film rapidly darkened and took on a lustrous black appearance; polytrifluoroethylene behaved similarly, but heating was required. A film of PVC went instantly black upon contact with SbF5 vapor.  
 IT **116071-12-6P**  
 RL: FORM (Formation, nonpreparative); PREP (Preparation)  
 (formation of, by cyclization of bis(trifluoromethyl)decafluorooctadiene, in presence of antimony pentafluoride)  
 RN 116071-12-6 CAPLUS  
 CN Cyclopentene, 1,4,5,5-tetrafluoro-3,3-bis(trifluoromethyl)-2-[2,2,2-trifluoro-1-(trifluoromethyl)ethyl]- (9CI) (CA INDEX NAME)



=>

L10 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:301117 CAPLUS  
 DN 138:304711  
 TI Novel fluoropolymer, resist compositions containing the same, and novel fluoromonomers  
 IN Araki, Takayuki; Ishikawa, Takuji; Koh, Meiten  
 PA Daikin Industries, Ltd., Japan  
 SO PCT Int. Appl., 153 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003031487	A1	20030417	WO 2002-JP10242	20021002
	W: JP, KR, US				
	RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				

PRAI JP 2001-307823 A 20011003  
 JP 2002-54964 A 20020228

OS MARPAT 138:304711

AB The present invention relates to a fluorocopolymer having aliph. monocyclic structures in the backbone chain, as represented by the general formula (M1)(M2a)(N) wherein structural unit (M1) is a unit derived from an ethylenic monomer having two or three carbon atoms and at least one fluorine atom; structural unit (M2a) is at least one kind of unit represented by the general formula I and forming an aliph. monocyclic structure in the backbone chain; and structural unit (N) is a unit derived from a monomer copolymerizable with structural units (M1) and (M2a), which comprises 1 to 99 mol% of structural units (M1), 1 to 99 mol% of structural units (M2a) and 0 to 98 mol% of structural units (N) and has a no.-av. mol. wt. of 500 to 1,000,000. In the formula I, R1 is at least one group selected from among divalent hydrocarbon groups which each have one to eight ring-constituting carbon atoms and may be substituted with hydrocarbyl or fluoroalkyl, and divalent hydrocarbon groups which each have an ether linkage with the sum of ring-constituting carbon and oxygen atoms ranging from 2 to 8 and may be substituted with hydrocarbyl or fluoroalkyl; R2 is alkylene having one to three ring-constituting carbon atoms; R3 and R4 are each independently alkylene having one or two carbon atoms; and n1, n2, and n3 are each independently 0 or 1. This fluorocopolymer exhibits excellent dry etching resistance and transparency in the vacuum UV region. Thus, 3.4 g cyclopentene and 10.0 g tetrafluoroethylene were reacted in HCFC 141b contg. bis(4-tert-butylcyclohexyl) peroxydicarbonate to give a 50:50 mol% copolymer with Mn 5700.

IT 509085-40-9P

RL: IMF (Industrial manufacture); PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(prepn. of fluoropolymers or fluoromonomers useful for photoresist compns.)

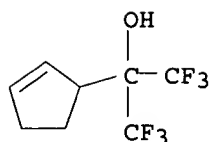
RN 509085-40-9 CAPLUS

CN 2-Cyclopentene-1-methanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 509085-39-6

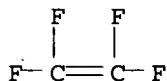
CMF C8 H8 F6 O



CM 2

CRN 116-14-3

CMF C2 F4



IT 509085-40-9DP, hydrolyzed

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(prepn. of fluoropolymers or fluoromonomers useful for photoresist compns.)

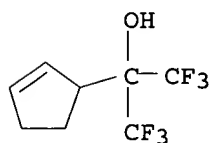
RN 509085-40-9 CAPLUS

CN 2-Cyclopentene-1-methanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 509085-39-6

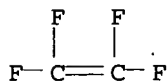
CMF C8 H8 F6 O



CM 2

CRN 116-14-3

CMF C2 F4



RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L10 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:353506 CAPLUS

DN 136:377479

TI High-molecular compounds for photoresists, monomeric compounds, photosensitive resin compositions, method for forming patterns with the compositions, and process for production of electronic components

IN Shida, Naomi; Ushirogouchi, Toru; Naito, Takuya

PA Kabushiki Kaisha Toshiba, Japan

SO PCT Int. Appl., 321 pp..

CODEN: PIXXD2

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002036646	A1	20020510	WO 2001-JP9567	20011031
	W: KR, US				
	JP 2002201219	A2	20020719	JP 2001-295012	20010926
PRAI	JP 2000-332358	A	20001031		
	JP 2001-295012	A	20010926		

OS MARPAT 136:377479

AB High-mol. compds. for photoresists, each having at least one skeleton represented by the general formula  $-RC(Rx1)_2(ORx1)$ , I, II, or III:  $-RC(Rx1)_2(ORx1)$  I II III (R = alicyclic skeleton; Rx1= electron-attracting group, H, monovalent org. group). The compds. shows small absorption towards .ltoreq.160 nm light and provides the fine resist pattern of nanometer size and of the high etching resistance.

IT 424825-88-7P 424825-93-4P 424825-96-7P

424825-99-0P 424826-05-1P 424826-07-3P

RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(high-mol. compds. for photoresists)

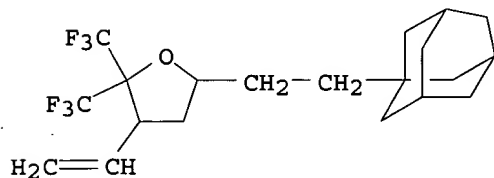
RN 424825-88-7 CAPLUS

CN 2,5-Furandione, polymer with 3-ethenyltetrahydro-5-(2-tricyclo[3.3.1.1<sup>3,7</sup>]dec-1-ylethyl)-2,2-bis(trifluoromethyl)furan and 1,3,3-tris(trifluoromethyl)-2-oxabicyclo[3.2.1]oct-6-ene (9CI) (CA INDEX NAME)

CM 1

CRN 424825-87-6

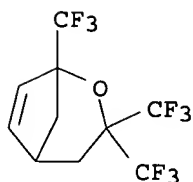
CMF C20 H26 F6 O



CM 2

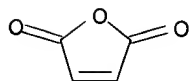
CRN 424825-86-5

CMF C10 H7 F9 O



CM 3

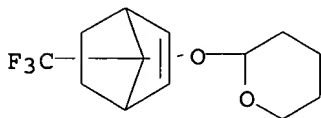
CRN 108-31-6  
CMF C4 H2 O3



RN 424825-93-4 CAPLUS  
CN 2H-Pyran, tetrahydro-2-[[7-(trifluoromethyl)bicyclo[2.2.1]hept-2-en-7-yl]oxy]-, polymer with 2,2,5,5-tetrafluoro-2,5-dihydrofuran (9CI) (CA INDEX NAME)

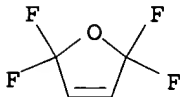
CM 1

CRN 424825-92-3  
CMF C13 H17 F3 O2



CM 2

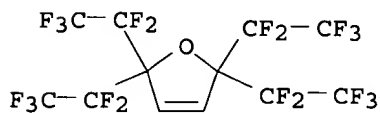
CRN 24565-48-8  
CMF C4 H2 F4 O



RN 424825-96-7 CAPLUS  
CN Furan, 2,5-dihydro-2,2,5,5-tetrakis(pentafluoroethyl)-, polymer with 1-[2,2,2-trifluoro-1-[(2-methoxyethoxy)methoxy]-1-(trifluoromethyl)ethyl]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

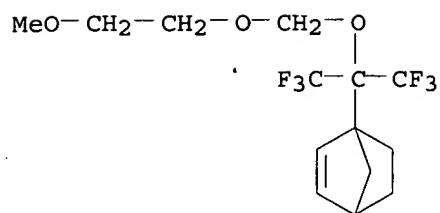
CRN 424825-95-6  
CMF C12 H2 F20 O



CM 2

CRN 424825-94-5  
CMF C14 H18 F6 O3



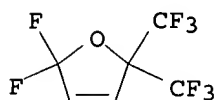


RN 424825-99-0 CAPLUS  
 CN Furan, 2,2-difluoro-2,5-dihydro-5,5-bis(trifluoromethyl)-, polymer with 1-[1-(1-butoxyethoxy)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 424825-98-9

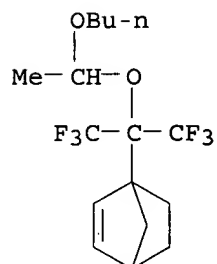
CMF C6 H2 F8 O



CM 2

CRN 424825-97-8

CMF C16 H22 F6 O2

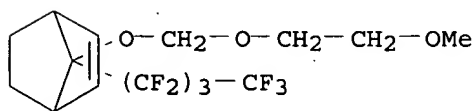


RN 424826-05-1 CAPLUS  
 CN 2,5-Furandione, polymer with 7-[(2-methoxyethoxy)methoxy]-7-(nonafluorobutyl)bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

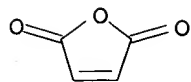
CRN 424826-04-0

CMF C15 H17 F9 O3



CM 2

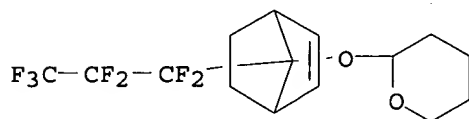
CRN 108-31-6  
CMF C4 H2 O3



RN 424826-07-3 CAPLUS  
CN 2H-Pyran, 2-[[7-(heptafluoropropyl)bicyclo[2.2.1]hept-2-en-7-yl]oxy]tetrahydro-, polymer with 2,5-dihydro-2,2,5,5-tetrakis(trifluoromethyl)furan (9CI) (CA INDEX NAME)

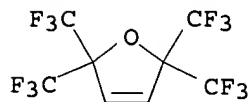
CM 1

CRN 424826-06-2  
CMF C15 H17 F7 O2



CM 2

CRN 424825-90-1  
CMF C8 H2 F12 O



RE.CNT 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

=>

L11 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2003 ACS on STN  
AN 2003:301117 CAPLUS  
DN 138:304711  
TI Novel fluoropolymer, resist compositions containing the same, and novel fluoromonomers  
IN Araki, Takayuki; Ishikawa, Takuji; Koh, Meiten  
PA Daikin Industries, Ltd., Japan  
SO PCT Int. Appl., 153 pp.  
CODEN: PIXXD2  
DT Patent  
LA Japanese  
FAN.CNT 1

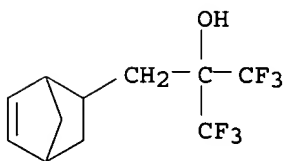
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003031487	A1	20030417	WO 2002-JP10242	20021002
	W: JP, KR, US				
	RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				
PRAI	JP 2001-307823	A	20011003		
	JP 2002-54964	A	20020228		
OS	MARPAT 138:304711				
RE.CNT 2	THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD ALL CITATIONS AVAILABLE IN THE RE FORMAT				

L11 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2003 ACS on STN  
AN 2002:353506 CAPLUS  
DN 136:377479  
TI High-molecular compounds for photoresists, monomeric compounds, photosensitive resin compositions, method for forming patterns with the compositions, and process for production of electronic components  
IN Shida, Naomi; Ushirogouchi, Toru; Naito, Takuya  
PA Kabushiki Kaisha Toshiba, Japan  
SO PCT Int. Appl., 321 pp.  
CODEN: PIXXD2  
DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002036646	A1	20020510	WO 2001-JP9567	20011031
	W: KR, US				
	JP 2002201219	A2	20020719	JP 2001-295012	20010926
PRAI	JP 2000-332358	A	20001031		
	JP 2001-295012	A	20010926		
OS	MARPAT 136:377479				
RE.CNT 23	THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD ALL CITATIONS AVAILABLE IN THE RE FORMAT				

L16 ANSWER 77 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:747183 CAPLUS  
 DN 135:310922  
 TI **Photoresist resin** composition comprising novel  
 polysiloxane silicon-containing alicyclic compound  
 IN Iwasawa, Haruo; Shimokawa, Tsutomu; Akihiro, Hayashi; Nishiyama, Satoru  
 PA JSR Corporation, Japan  
 SO Eur. Pat. Appl., 109 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1142928	A1	20011010	EP 2001-108625	20010405
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2001288268	A2	20011016	JP 2000-107207	20000407
	JP 2002105086	A2	20020410	JP 2000-291089	20000925
	JP 2002128788	A2	20020509	JP 2000-318752	20001019
	US 2001041769	A1	20011115	US 2001-824224	20010403
	US 6531260	B2	20030311		
PRAI	JP 2000-107207	A	20000407		
	JP 2000-291089	A	20000925		
	JP 2000-318752	A	20001019		
AB	A novel polysiloxane having the structural units of the following formula I, II and III (A1, A2 = acid-dissociable monovalent org. group, R1 = H, monovalent (halogenated) hydrocarbon, halogen, amino, R2 = monovalent (halogenated) hydrocarbon group, halogen) is disclosed. A method of prepg. such a polysiloxane, a silicon-contg. alicyclic compd. providing this polysiloxane, and a radiation-sensitive <b>resin</b> compn. comprising this polysiloxane are also provided. The polysiloxane is useful as a <b>resin</b> component for a resist material, effectively senses radiation with a short wavelength (157-248 nm), exhibits high transparency to radiation and superior dry etching properties, and excels in basic resist properties required for resist materials such as high sensitivity, resolu., developability, etc.				
IT	<b>196314-61-1</b> RL: RCT (Reactant); RACT (Reactant or reagent) (in prepn. of silicon-contg. alicyclic compd.)				
RN	196314-61-1 CAPLUS				
CN	Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha., .alpha.-bis(trifluoromethyl)-(9CI) (CA INDEX NAME)				



RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L16 ANSWER 78 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:636379 CAPLUS  
 DN 135:218727  
 TI Resist materials for 157-nm lithography  
 IN Fedynyshyn, Theodore H.  
 PA Massachusetts Institute of Technology, Inc., USA  
 SO PCT Int. Appl., 43 pp.

CODEN: PIXXD2

DT Patent  
LA English  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	WO 2001063362	A2	20010830	WO 2	

L16 ANSWER 78 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:636379 CAPLUS  
 DN 135:218727  
 TI Resist materials for 157-nm lithography  
 IN Fedynyshyn, Theodore H.  
 PA Massachusetts Institute of Technology, Inc., USA  
 SO PCT Int. Appl., 43 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001063362	A2	20010830	WO 2001-US5907	20010226
	WO 2001063362	A3	20020307		
	W: CA, JP				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
	US 6468712	B1	20021022	US 2000-513792	20000225
	EP 1257880	A2	20021120	EP 2001-911149	20010226
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
PRAI	US 2000-513792	A	20000225		
	WO 2001-US5907	W	20010226		

AB The invention relates to **photoresist** materials useful in microlithog. and to improved materials and methods for pattern formation on semiconductor wafers. A radiation sensitive **resin** compn. including a photo-acid generator and an aliph. **polymer** having .gtoreq.1 electron withdrawing groups adjacent to or attached to a C atom bearing a protected hydroxyl group, wherein the protecting group is labile in the presence of in situ generated acid is described. The radiation sensitive **resin** compn. can be used as a resist suitable for image transfer by plasma etching and enable 1 to obtain an etching image having high precision with high reproducibility with a high degree of resoln. and selectivity.

IT **357397-06-9D**, functional-group protected **357397-07-0D**, functional-group protected **357397-08-1D**, functional-group protected **357397-09-2D**, functional-group protected  
 RL: DEV (Device component use); POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)  
 (pos. **photoresist** compn. for 157-nm lithog. using)

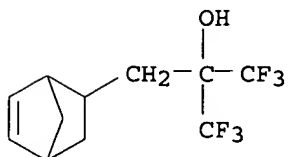
RN 357397-06-9 CAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha..alpha.-bis(trifluoromethyl)-, polymer with tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1

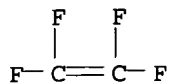
CMF C11 H12 F6 O



CM 2

CRN 116-14-3

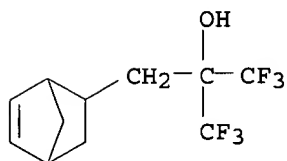
CMF C2 F4



RN 357397-07-0 CAPLUS  
 CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

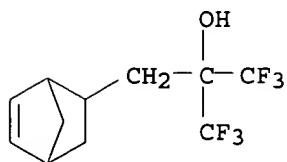
CRN 196314-61-1  
 CMF C11 H12 F6 O



RN 357397-08-1 CAPLUS  
 CN 2-Propenoic acid, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

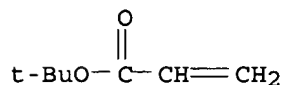
CM 1

CRN 196314-61-1  
 CMF C11 H12 F6 O



CM 2

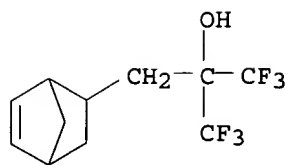
CRN 1663-39-4  
 CMF C7 H12 O2



RN 357397-09-2 CAPLUS  
 CN 2,5-Furandione, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

CM 1

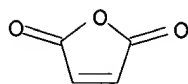
CRN 196314-61-1  
 CMF C11 H12 F6 O



CM 2

CRN 108-31-6

CMF C4 H2 O3





L16 ANSWER 82 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:380920 CAPLUS  
 DN 134:359532  
 TI Nitrile/fluoroalcohol-containing photoresists and associated processes for microlithography  
 IN Fryd, Michael; Schadt, Frank Leonard, III; Periyasamy, Mookkan  
 PA E.I. Du Pont De Nemours and Company, USA  
 SO PCT Int. Appl., 40 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001037047	A2	20010525	WO 2000-US31136	20001114
	WO 2001037047	A3	20020328		
	W:		AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM		
	RW:		GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG		
	EP 1240554	A2	20020918	EP 2000-978579	20001114
	R:		AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR		
	US 6503686	B1	20030107	US 2000-714782	20001116
PRAI	US 1999-166035P	P	19991117		
	WO 2000-US31136	W	20001114		

AB The invention pertains to photoimaging and use of photoresists (pos.- and neg.-working) for imaging in the prodn. of semiconductor devices and to photoresists contg. **polymer** compns. having high UV transparency, particularly at short wavelengths, e. g., 157 nm or 193 nm, that are useful as base resins in resists and potentially, in many other applications. Nitrile/fluoroalc.-contg. photoresists and assocd. processes for microlithog. are described. These photoresists are comprised of a fluoroalc. functional group and a nitrile-contg. compd. which together simultaneously impart high UV transparency and development in basic media to these materials. The materials have high UV transparency, particularly at short wavelengths, e.g., 157 nm, which makes them highly useful for lithog. at these short wavelengths.

IT **339265-99-5P 339266-00-1P 339266-01-2P**  
 RL: NUU (Other use, unclassified); PNU (Preparation, unclassified); POF (Polymer in formulation); PREP (Preparation); USES (Uses)  
 (prepn. of polymers for nitrile/fluoroalc.-contg. compns. for photoresists having high UV transparency)

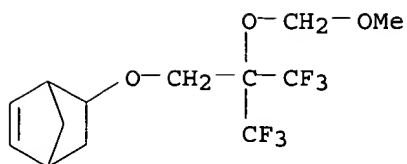
RN 339265-99-5 CAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with 2-propenenitrile and 5-[3,3,3-trifluoro-2-(methoxymethoxy)-2-(trifluoromethyl)propoxy]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 305815-64-9

CMF C13 H16 F6 O3



CM 2

CRN 107-13-1

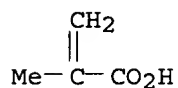
CMF C3 H3 N



CM 3

CRN 79-41-4

CMF C4 H6 O2



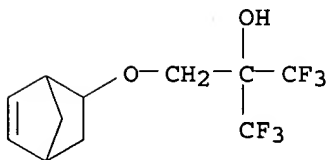
RN 339266-00-1 CAPLUS

CN 2-Propenoic acid, 2-methyl-, 1,1-dimethylethyl ester, polymer with 2-[(bicyclo[2.2.1]hept-5-en-2-yloxy)methyl]-1,1,1,3,3,3-hexafluoro-2-propanol and 2-propenenitrile (9CI) (CA INDEX NAME)

CM 1

CRN 305815-63-8

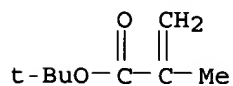
CMF C11 H12 F6 O2



CM 2

CRN 585-07-9

CMF C8 H14 O2



CM 3

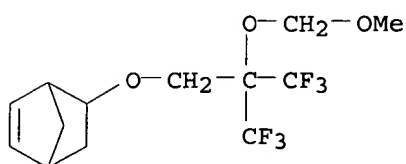
CRN 107-13-1  
CMF C3 H3 N



RN 339266-01-2 CAPLUS  
CN 2-Propenoic acid, 2-methyl-, polymer with 1,1-dimethylethyl  
2-methyl-2-propenoate, 2-propenenitrile and 5-[3,3,3-trifluoro-2-(methoxymethoxy)-2-(trifluoromethyl)propoxy]bicyclo[2.2.1]hept-2-ene (9CI)  
(CA INDEX NAME)

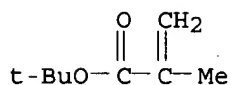
CM 1

CRN 305815-64-9  
CMF C13 H16 F6 O3



CM 2

CRN 585-07-9  
CMF C8 H14 O2



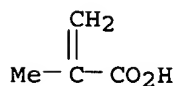
CM 3

CRN 107-13-1  
CMF C3 H3 N



CM 4

CRN 79-41-4  
CMF C4 H6 O2

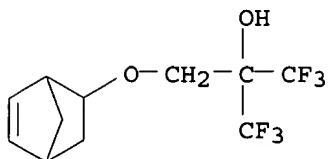


IT 305815-63-8P 305815-64-9P  
RL: NUU (Other use, unclassified); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(prepn. of, for nitrile/fluoroalc.-contg. **polymer** compns. for photoresists having high UV transparency)

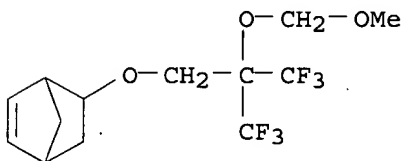
RN 305815-63-8 CAPLUS

CN 2-Propanol, 2-[(bicyclo[2.2.1]hept-5-en-2-yloxy)methyl]-1,1,1,3,3,3-hexafluoro- (9CI) (CA INDEX NAME)



RN 305815-64-9 CAPLUS

CN Bicyclo[2.2.1]hept-2-ene, 5-[3,3,3-trifluoro-2-(methoxymethoxy)-2-(trifluoromethyl)propoxy]- (9CI) (CA INDEX NAME)



L16 ANSWER 83 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:870325 CAPLUS

DN 134:214846

TI 157 nm resist materials: Progress report

AU Brodsky, Colin; Byers, Jeff; Conley, Will; Hung, Raymond; Yamada, Shintaro; Patterson, Kyle; Somervell, Mark; Trinquen, Brian; Tran, H. V.; Cho, Sungseo; Chiba, Takashi; Lin, Shang-Ho; Jamieson, Andrew; Johnson, Heather; Vander Heyden, Tony; Willson, C. Grant

CS Departments of Chemistry and Chemical Engineering, The University of Texas at Austin, Austin, TX, 78735, USA

SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (2000), 18(6), 3396-3401

CODEN: JVTBD9; ISSN: 0734-211X

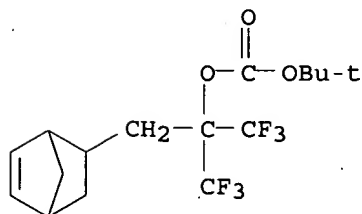
PB American Institute of Physics

DT Journal

LA English

AB Many semiconductor device manufacturers plan to make products with 157 nm lithog. beginning in 2004. There is, at this time, no functional **photoresist** suitable for 157 nm exposure. Developing resist materials for 157 nm lithog. is particularly challenging since water, oxyg

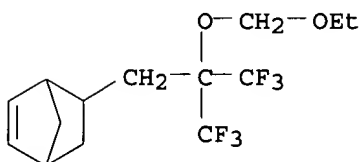
L16 ANSWER 83 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2000:870325 CAPLUS  
 DN 134:214846  
 TI 157 nm resist materials: Progress report  
 AU Brodsky, Colin; Byers, Jeff; Conley, Will; Hung, Raymond; Yamada, Shintaro; Patterson, Kyle; Somervell, Mark; Tringue, Brian; Tran, H. V.; Cho, Sungseo; Chiba, Takashi; Lin, Shang-Ho; Jamieson, Andrew; Johnson, Heather; Vander Heyden, Tony; Willson, C. Grant  
 CS Departments of Chemistry and Chemical Engineering, The University of Texas at Austin, Austin, TX, 78735, USA  
 SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (2000), 18(6), 3396-3401  
 CODEN: JVTBD9; ISSN: 0734-211X  
 PB American Institute of Physics  
 DT Journal  
 LA English  
 AB Many semiconductor device manufacturers plan to make products with 157 nm lithog. beginning in 2004. There is, at this time, no functional **photoresist** suitable for 157 nm exposure. Developing resist materials for 157 nm lithog. is particularly challenging since water, oxygen, and even polyethylene are strongly absorbing at this wavelength. A modular approach to the design of a single layer resist for 157 nm has been undertaken. In this approach, the resist has been conceptually segmented into four functional modules: an acidic group, an acid labile protecting group, an etch resistant moiety, and a **polymer** backbone. Each of these modules has an assigned function and each must be transparent at 157 nm. Progress has been made toward finding candidate structures for each of these modules. The authors have demonstrated that acidic bistrifluoromethylcarbinols are very transparent at 157 nm and function efficiently in chem. amplified resists with both high and low activation energy protecting groups. Judicious incorporation of fluorine in acrylates and alicyclics has provided etch resistant polymers with greatly improved transparency at 157 nm. In particular, esters of poly(.alpha.-trifluoromethylacrylic acid) are far more transparent than their protio analogs. The Diels-Alder adducts derived from reaction of these and other fluorinated alkenes with cyclopentadiene offer a route to a wide range of alicyclic monomers that show great promise as transparent, etch resistant platforms for the design of 157 nm resists. Polymers of this sort with absorbance below 2 per .mu.m are reported.  
 IT 302580-86-5 328114-62-1  
 RL: PRP (Properties)  
 (design of **photoresist** materials for 157 nm lithog.).  
 RN 302580-86-5 CAPLUS  
 CN Carbonic acid, 1-(bicyclo[2.2.1]hept-5-en-2-ylmethyl)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl 1,1-dimethylethyl ester, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 196314-63-3  
 CMF C16 H20 F6 O3



RN 328114-62-1 CAPLUS  
CN 2,5-Furandione, polymer with 5-[2-(ethoxymethoxy)-3,3,3-trifluoro-2-(trifluoromethyl)propyl]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

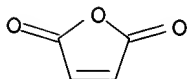
CM 1

CRN 328114-61-0  
CMF C14 H18 F6 O2



CM 2

CRN 108-31-6  
CMF C4 H2 O3



RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

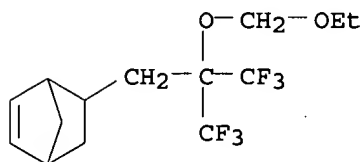
L16 ANSWER 84 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN  
AN 2000:806346 CAPLUS  
DN 134:200397  
TI Polymers for 157-nm **photoresist** applications: a progress report  
AU Patterson, Kyle; Yamachika, Miko; Hung, Raymond J.; Brodsky, Colin J.;  
Yamada, Shintaro; Somervell, Mark H.; Osborn, Brian; Hall, Daniel;  
Dukovic, Gordana; Byers, Jeffrey; Conley, Willard; Willson, C. Grant  
CS Dep. Chemistry and Chem. Eng., The Univ. Texas at Austin, Austin, TX, USA  
SO Proceedings of SPIE-The International Society for Optical Engineering  
(2000), 3999(Pt. 1, Advances in Resist Technology and Processing XVII),  
365-374  
CODEN: PSISDG; ISSN: 0277-786X  
PB SPIE-The International Society for Optical Engineering  
DT Journal  
LA English  
AB Finding materials that offer the all of the characteristics required of  
**photoresist** matrix **resin** polymers while trying to  
maintain a high level of transparency at 157 nm is a daunting challenge.  
To simplify this task, the authors have broken the design of these  
polymers down into subunits, each of which was responsible for a required  
function in the final material. In addn., the authors have begun  
collecting gas-phase VUV spectra of these potential subunits to measure  
their individual absorbance contributions. Progress on developing  
materials for each of these subunits were presented along with plans for  
future studies.  
IT 328114-62-1  
RL: PRP (Properties); TEM (Technical or engineered material use); USES  
(Uses)  
(model **polymer**; design of polymers and their subunits for  
157-nm **photoresist** applications)  
RN 328114-62-1 CAPLUS

CN 2,5-Furandione, polymer with 5-[2-(ethoxymethoxy)-3,3,3-trifluoro-2-(trifluoromethyl)propyl]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 328114-61-0

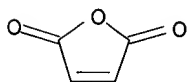
CMF C14 H18 F6 O2



CM 2

CRN 108-31-6

CMF C4 H2 O3



RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L16 ANSWER 85 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:806336 CAPLUS

DN 134:214824

TI Using alicyclic polymers in top surface imaging systems to reduce line-edge roughness

AU Somervell, Mark H.; Fryer, David S.; Osborn, Brian; Patterson, Kyle; Cho, Sungseo; Byers, Jeffrey D.; Willson, C. Grant

CS Univ. of Texas at Austin, Dallas, TX, USA

SO Proceedings of SPIE-The International Society for Optical Engineering (2000), 3999(Pt. 1, Advances in Resist Technology and Processing XVII), 270-282

CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

AB Top surface imaging (TSI) systems based on vapor phase silylation have been investigated for use at a variety of wavelengths. This approach to generating high aspect ratio, high resolu. images held great promise particularly for 193 nm and extreme-UV lithog. applications. Several 193 nm TSI systems have been described that produce very high resolu. (low k factor) images with wide process latitude. However, because of the line edge roughness assocd. with the final images, TSI systems have fallen from favor. In fact, top surface imaging and line edge roughness have become synonymous in the minds of most. Most of the 193 nm TSI systems are based on poly(p-hydroxystyrene) resins. These polymers have an unfortunate combination of properties that limit their utility in this application. These limiting properties include (1) high optical d., (2) poor silylation contrast, and (3) low glass transition temp. of the silylated material. These shortcomings are related to inherent **polymer** characteristics and are responsible for the pronounced line edge roughness in the poly(p-hydroxystyrene) systems. The authors synthesized certain alicyclic polymers that have higher transparency and higher glass

transition temps. Using these polymers, the authors demonstrated the ability to print high resolu. features with very smooth sidewalls. This paper describe the synthesis and characterization of the polymers and their application to top surface imaging at 193 nm. The anal. that was used to tailor the processing and the **polymer's** phys. properties to achieve optimum imaging is also described.

IT 214079-69-3

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(lithog. performance of alicyclic-**polymer** based chem.

amplified photoresists in top surface imaging for redn. of line-edge roughness)

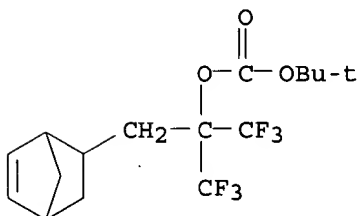
RN 214079-69-3 CAPLUS

CN Carbonic acid, 1-(bicyclo[2.2.1]hept-5-en-2-ylmethyl)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl 1,1-dimethylethyl ester, polymer with sulfur dioxide, alternating (9CI) (CA INDEX NAME)

CM 1

CRN 196314-63-3

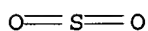
CMF C16 H20 F6 O3



CM 2

CRN 7446-09-5

CMF O2 S



RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L16 ANSWER 86 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:806316 CAPLUS

DN 134:200382

TI Negative-tone 193-nm resists

AU Cho, Sungseo; Vander Heyden, Anthony; Byers, Jeffrey D.; Willson, C. Grant  
CS Univ. of Texas at Austin, Austin, TX, USA

SO Proceedings of SPIE-The International Society for Optical Engineering  
(2000), 3999(Pt. 1, Advances in Resist Technology and Processing XVII),  
62-73

CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

AB A great deal of progress has been made in the design of single layer pos. tone resists for 193 nm lithog. Com. samples of such materials are now available from many vendors. The patterning of certain levels of devices profits from the use of neg. tone resists. There have been several reports of work directed toward the design of neg. tones resists for 193



nm exposure but, none have performed as well as the pos. tone systems. Polymers with alicyclic structures in the backbone have emerged as excellent platforms from which to design pos. tone resists for 193 nm exposure. The authors report the adaptation of this class of polymers to the design of high performance neg. tone 193 nm resists. New systems have been prep'd. that are based on a polarity switch mechanism for modulation of the dissoln. rate. The systems are based on a polar, alicyclic **polymer** backbone that includes a monomer bearing a glycol pendant group that undergoes the acid catalyzed pinacol rearrangement upon exposure and bake to produce the corresponding less polar ketone. This monomer was copoly'd. with maleic anhydride and a norbornene bearing a bis-trifluoromethylcarbinol. The rearrangement of the **copolymer** was monitored by FT-IR as a function of temp. The synthesis of the norbornene monomers will be presented together with characterization of copolymers of these monomers with maleic anhydride. The lithog. performance of the new resist system will also be presented.

IT 327610-81-1P

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(photoresist for 193 nm lithog. contg. terpolymer of maleic anhydride and norbornene with bis-trifluoromethylcarbinol and norbornene with glycol pendant group that undergoes acid catalyzed pinacol rearrangement)

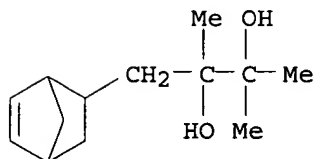
RN 327610-81-1 CAPLUS

CN 2,5-Furandione, polymer with 1-bicyclo[2:2.1]hept-5-en-2-yl-2,3-dimethyl-2,3-butanediol and .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

CM 1

CRN 327610-80-0

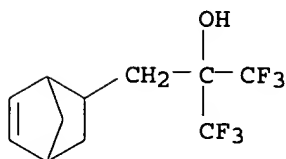
CMF C13 H22 O2



CM 2

CRN 196314-61-1

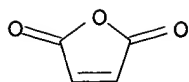
CMF C11 H12 F6 O



CM 3

CRN 108-31-6

CMF C4 H2 O3



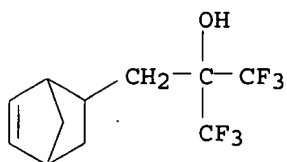
IT 196314-61-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(polymn. with maleic anhydride and (dihydroxydimethylbutyl)bicyclo[2.2.1]heptene in synthesis of **polymer** photoresists for 193 nm lithog.)

RN 196314-61-1 CAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-(9CI) (CA INDEX NAME)



RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L16 ANSWER 87 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:790750 CAPLUS

DN 133:357252

TI Fluorinated polymers, photoresists and processes for microlithography

IN Feiring, Andrew Edward; Feldman, Jerald

PA E.I. Du Pont De Nemours and Company, USA

SO PCT Int. Appl., 69 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

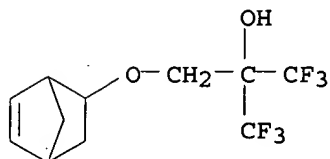
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000067072	A1	20001109	WO 2000-US11539	20000428
	W:	AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
	RW:	GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
	EP 1183571	A1	20020306	EP 2000-928563	20000428
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO			
	JP 2002543469	T2	20021217	JP 2000-615852	20000428
PRAI	US 1999-132373P	P	19990504		
	WO 2000-US11539	W	20000428		
AB	Fluorinated polymers, photoresists and assocd. processes for microlithog. are described. These polymers and photoresists are comprised of a fluoroalc. functional group which simultaneously imparts high UV transparency and developability in basic media to these materials. The materials of this invention have high UV transparency, particularly at short wavelengths, e.g. 157 nm, which makes them highly useful for lithog. at these short wavelengths.				
IT	305815-63-8P 305815-64-9P				

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)

(fluorinated polymers, photoresists and processes for microlithog.)

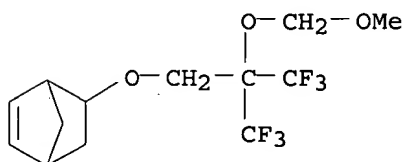
RN 305815-63-8 CAPLUS

CN 2-Propanol, 2-[(bicyclo[2.2.1]hept-5-en-2-yloxy)methyl]-1,1,1,3,3,3-  
hexafluoro- (9CI) (CA INDEX NAME)



RN 305815-64-9 CAPLUS

CN Bicyclo[2.2.1]hept-2-ene, 5-[3,3,3-trifluoro-2-(methoxymethoxy)-2-  
(trifluoromethyl)propoxy]- (9CI) (CA INDEX NAME)



IT 305815-68-3P 305815-71-8P 305815-78-5P

RL: SPN (Synthetic preparation); PREP (Preparation)

(fluorinated polymers, photoresists and processes for microlithog.)

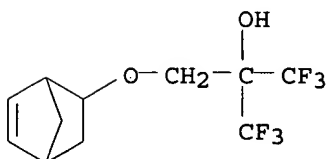
RN 305815-68-3 CAPLUS

CN 2-Propanol, 2-[(bicyclo[2.2.1]hept-5-en-2-yloxy)methyl]-1,1,1,3,3,3-  
hexafluoro-, polymer with bicyclo[2.2.1]hept-2-ene and tetrafluoroethene  
(9CI) (CA INDEX NAME)

CM 1

CRN 305815-63-8

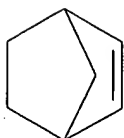
CMF C11 H12 F6 O2



CM 2

CRN 498-66-8

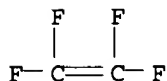
CMF C7 H10



CM 3

CRN 116-14-3

CMF C2 F4



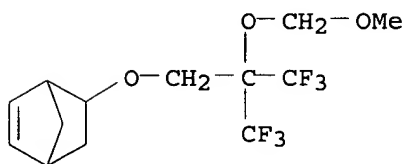
RN 305815-71-8 CAPLUS

CN Bicyclo[2.2.1]hept-2-ene, 5-[3,3,3-trifluoro-2-(methoxymethoxy)-2-(trifluoromethyl)propoxy]-, polymer with bicyclo[2.2.1]hept-2-ene and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 305815-64-9

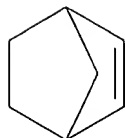
CMF C13 H16 F6 O3



CM 2

CRN 498-66-8

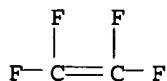
CMF C7 H10



CM 3

CRN 116-14-3

CMF C2 F4



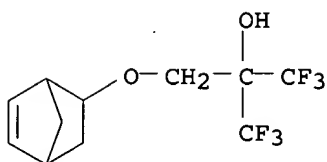
RN 305815-78-5 CAPLUS

CN 2-Propanol, 2-[(bicyclo[2.2.1]hept-5-en-2-yloxy)methyl]-1,1,1,3,3,3-hexafluoro-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 305815-63-8

CMF C11 H12 F6 O2



IT 305815-72-9P 305815-73-0P

RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(fluorinated polymers, photoresists and processes for microlithog.)

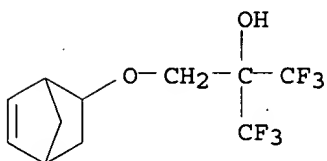
RN 305815-72-9 CAPLUS

CN 2-Propanol, 2-[(bicyclo[2.2.1]hept-5-en-2-yloxy)methyl]-1,1,1,3,3,3-hexafluoro-, polymer with tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 305815-63-8

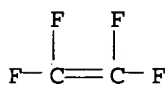
CMF C11 H12 F6 O2



CM 2

CRN 116-14-3

CMF C2 F4



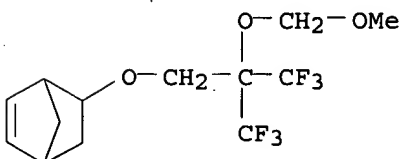
RN 305815-73-0 CAPLUS

CN 2-Propanol, 2-[(bicyclo[2.2.1]hept-5-en-2-yloxy)methyl]-1,1,1,3,3,3-hexafluoro-, polymer with tetrafluoroethene and 5-[3,3,3-trifluoro-2-(methoxymethoxy)-2-(trifluoromethyl)propoxy]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 305815-64-9

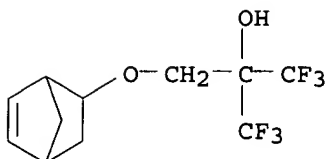
CMF C13 H16 F6 O3



CM 2

CRN 305815-63-8

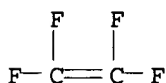
CMF C11 H12 F6 O2



CM 3

CRN 116-14-3

CMF C2 F4



RE.CNT 4      THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L16 ANSWER 88 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:711711 CAPLUS

DN 134:107878

TI Study of the fundamental contributions to line edge roughness in a 193 nm, top surface imaging system

AU Somervell, Mark H.; Fryer, David S.; Osborn, Brian; Patterson, Kyle; Byers, Jeffrey; Willson, C. Grant

CS Department of Chemical Engineering, The University of Texas at Austin, Austin, TX, 78731, USA

SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (2000), 18(5), 2551-2559

CODEN: JVTBD9; ISSN: 0734-211X

PB American Institute of Physics

DT Journal

LA English

AB Top surface imaging systems based on vapor phase silylation have been investigated for use at a variety of wavelengths. This approach to generate high aspect ratio, high resoln. images held great promise particularly for 193 nm and extreme-UV lithog. applications. Several 193 nm top surface imaging (TSI) systems have been described that produce very high resoln. (low k factor) images with wide process latitude. However, because of the line edge roughness assocd. with the final images, TSI systems have fallen from favor. In fact, TSI does not appear in the strategy or plan for any imaging technol. at this time. Most of the 193 nm TSI systems that have been studied are based on poly(p-hydroxystyrene) resins. These polymers have an unfortunate combination of properties that limit their utility in this application. These limiting properties include (1) high optical d., (2) poor silylation contrast, and (3) low glass transition temp. of the silylated material. These shortcomings are related to inherent **polymer** characteristics and are responsible for the pronounced line edge roughness in the poly(p-hydroxystyrene) systems. The authors have synthesized certain alicyclic polymers that have higher transparency and higher glass transition temps. Using these polymers, we have demonstrated the ability to print high resoln. features

with very smooth sidewalls. This article describes the synthesis and characterization of the polymers, their application to top surface imaging at 193 nm, and the anal. that was used to tailor the processing and the polymer's phys. properties to achieve optimum imaging.

IT 214079-69-3

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(factors contributing to photoresist line edge roughness in photolithog. surface imaging systems based on vapor phase silylation)

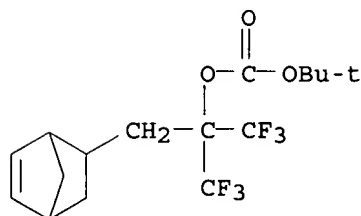
RN 214079-69-3 CAPLUS

CN Carbonic acid, 1-(bicyclo[2.2.1]hept-5-en-2-ylmethyl)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl 1,1-dimethylethyl ester, polymer with sulfur dioxide, alternating (9CI) (CA INDEX NAME)

CM 1

CRN 196314-63-3

CMF C16 H20 F6 O3



CM 2

CRN 7446-09-5

CMF O2 S

O=S=O

RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L16 ANSWER 89 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN

AN 1997:582361 CAPLUS

DN 127:270389

TI Synthesis and preliminary evaluation of substituted poly(norbornene sulfones) for 193 nm lithography

AU Ito, Hiroshi; Seehof, Norbert; Sato, Rikiya

CS IBM Almaden Research Center, San Jose, CA, 95120, USA

SO Polymeric Materials Science and Engineering (1997), 77, 449-450

CODEN: PMSEDG; ISSN: 0743-0515

PB American Chemical Society

DT Journal

LA English

AB The quest for higher resolu. continues in the microelectronics industry, which is currently shifting from i-line (365 nm) to deep UV (248 nm, KrF excimer laser) lithog. for manuf. of 256 megabit memory and related logic devices requiring 0.25 .mu.m resolu. This transition has been made possible by the revolutionary resist systems known as chem. amplification resists. In order to achieve even higher resolu. for a next generation device program, further shift to 193 nm (ArF excimer laser) has become a major thrust recently. Although the imaging mechanism of choice is most likely to be acid-catalyzed deprotection for pos. imaging in ArF lithog.

as is the case with KrF, **polymer** backbone structures require a total departure from the current phenolic systems. Arom. polymers cannot be used at the ArF excimer laser wavelength due to their excessive absorption. Thus, poly-methacrylates have been the dominant **polymer** backbone structure with a pendant bi-alicyclic group providing dry etch resistance. Excellent dry etch resistance of main chain alicyclic polymers such as polynorbornene has recently prompted efforts in development of chem. amplified resists based on such back bone structures. Since radical polymn. is still the most practical method of **polymer** prepn., we have decided to investigate alternating radical copolymn. of substituted norbornenes with sulfur dioxide. While the phenolic OH group has been the primary base-solubilizing functional group employed in the 248 nm resist design, the 193 nm resists have been exclusively based on carboxylic acid, which provides extremely fast dissoln. rates in aq. base, necessitating use of a non-std. weak aq. base developer. Thus, another goal we set forth was to identify a new base-solubilizing group which could be incorporated in 193 nm resists.

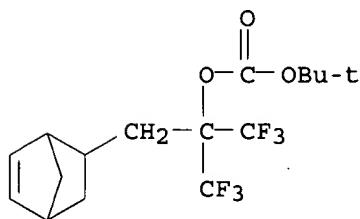
IT 196314-63-3P

RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(synthesis and preliminary evaluation of substituted poly(norbornene sulfones) for 193 nm lithog.)

RN 196314-63-3 CAPLUS

CN Carbonic acid, 1-(bicyclo[2.2.1]hept-5-en-2-ylmethyl)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl 1,1-dimethylethyl ester (9CI) (CA INDEX NAME)



IT 196314-66-6P 196314-69-9P

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(synthesis and preliminary evaluation of substituted poly(norbornene sulfones) for 193 nm lithog.)

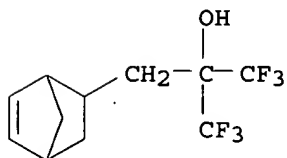
RN 196314-66-6 CAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and sulfur dioxide (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1

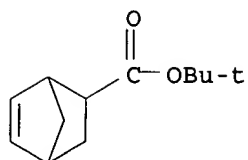
CMF C11 H12 F6 O



CM 2

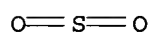


CRN 154970-45-3  
CMF C12 H18 O2



CM 3

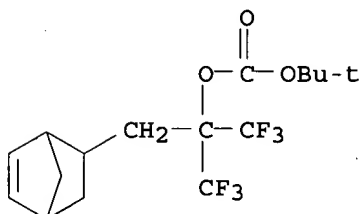
CRN 7446-09-5  
CMF O2 S



RN 196314-69-9 CAPLUS  
CN Carbonic acid, 1-(bicyclo[2.2.1]hept-5-en-2-ylmethyl)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl 1,1-dimethylethyl ester, polymer with sulfur dioxide (9CI) (CA INDEX NAME)

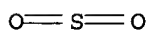
CM 1

CRN 196314-63-3  
CMF C16 H20 F6 O3

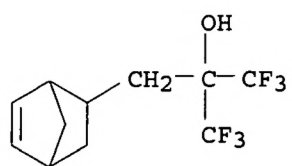


CM 2

CRN 7446-09-5  
CMF O2 S



IT 196314-61-1  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(synthesis and preliminary evaluation of substituted poly(norbornene sulfones) for 193 nm lithog.)  
RN 196314-61-1 CAPLUS  
CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-(9CI) (CA INDEX NAME)



=>

L16 ANSWER 68 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:918945 CAPLUS

DN 136:45683

TI Radiation-sensitive **resin** composition for chem. amplified resist

IN Nishimura, Yukio; Yamahara, Noboru; Yamamoto, Masafumi; Kajita, Toru; Shimokawa, Tsutomu; Ito, Hiroshi

PA JSR Corporation, Japan; International Business Machines Corporation

SO Eur. Pat. Appl., 63 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1164434	A2	20011219	EP 2001-114503	20010615
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2002072484	A2	20020312	JP 2001-108824	20010406
	US 2002009668	A1	20020124	US 2001-879894	20010614
	CN 1332205	A	20020123	CN 2001-124927	20010615
PRAI	JP 2000-182297	A	20000616		
	JP 2001-108824	A	20010406		

OS MARPAT 136:45683

AB A radiation-sensitive **resin** compn. comprising an acid-labile group-contg. **resin** and a photoacid generator is disclosed. The **resin** has a structure of X1R2COR1 (R1 = H, monovalent acid-labile group, C1-6 alkyl which does not have an acid-labile group, C2-7 alkylcarbonyl which does not have an acid-labile group; X1 = C1-4 fluorinated alkyl; and R2 = H, C1-10 alkyl, C1-10 fluorinated alkyl). The **resin** compn. exhibits high transmittance of radiation, high sensitivity, resolu., and pattern shape, and is useful as a chem. amplified resist in producing semiconductors at a high yield.

IT 370099-14-2P 370102-83-3P 380886-62-4P  
380886-63-5P 380886-66-8P 380886-68-0P  
380886-69-1P 380886-74-8DP, hydrogenated  
380886-74-8P 380886-75-9DP, hydrogenated  
380886-78-2P 380886-79-3P 380886-80-6P  
380886-81-7P 380886-82-8P 380886-83-9P

RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(acid-labile group-contg. **resin** for radiation-sensitive resist compn.)

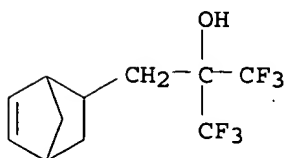
RN 370099-14-2 CAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

CM 1

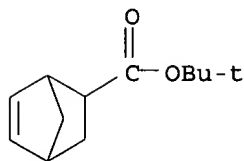
CRN 196314-61-1

CMF C11 H12 F6 O



CM 2

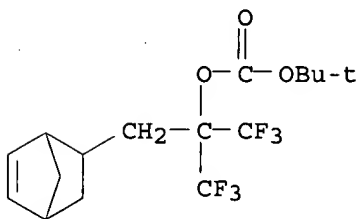
CRN 154970-45-3  
CMF C12 H18 O2



RN 370102-83-3 CAPLUS  
CN Carbonic acid, 1-(bicyclo[2.2.1]hept-5-en-2-ylmethyl)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

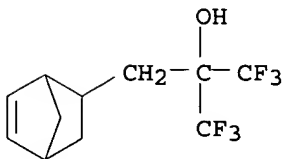
CM 1

CRN 196314-63-3  
CMF C16 H20 F6 O3



CM 2

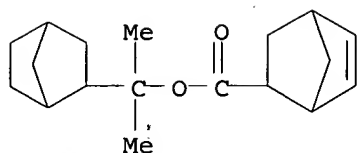
CRN 196314-61-1  
CMF C11 H12 F6 O



RN 380886-62-4 CAPLUS  
CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1-bicyclo[2.2.1]hept-2-yl-1-methylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

CM 1

CRN 380886-61-3  
CMF C18 H26 O2



CM 2

CRN 196314-61-1  
CMF C11 H12 F6 O

L16 ANSWER 74 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:791924 CAPLUS  
 DN 135:336912  
 TI **Polymer** having fluorinated maleic acid-type units,  
**photoresist** material, and patterning of the **photoresist**  
 IN Hatakeyama, Jun; Watanabe, Atsushi; Harada, Yuji  
 PA Shin-Etsu Chemical Industry Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 28 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001302735	A2	20011031	JP 2001-31743	20010208
	US 2001038969	A1	20011108	US 2001-783446	20010215
	US 6579658	B2	20030617		
PRAI	JP 2000-40190	A	20000217		
	JP 2000-40193	A	20000217		

AB The **polymer** involves fluorinated maleic anhydride- or maleimide-derived repeating units. The **photoresist** material contains the **polymer**. A chem. amplified **photoresist** contg. the **polymer**, an org. solvent, an acid-generating agent, and a basic compd. is also claimed. The **photoresist** material is applied on a substrate, heated, exposed to high-energy beam or electron beam at .ltoreq.300 nm through a photomask, and developed optionally after heating. The **photoresist** material, showing high sensitivity F2 excimer laser, is suitable for fine processing in semiconductor device fabrication.

IT 370566-02-2P 370566-03-3P 370566-09-9P  
 370566-10-2P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(**photoresist** contg. **polymer** involving fluorinated maleic anhydride- or maleimide-derived repeating units)

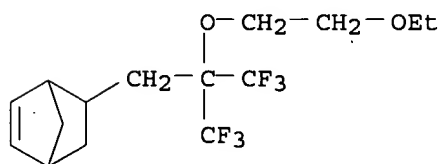
RN 370566-02-2 CAPLUS

CN 2,5-Furandione, 3,4-difluoro-, polymer with 5-[2-(2-ethoxyethoxy)-3,3,3-trifluoro-2-(trifluoromethyl)propyl]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 370566-01-1

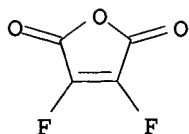
CMF C15 H20 F6 O2



CM 2

CRN 669-78-3

CMF C4 F2 O3



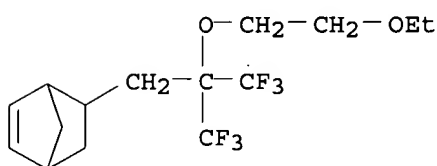
RN 370566-03-3 CAPLUS

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1-ethylcyclopentyl ester, polymer with 3,4-difluoro-2,5-furandione and 5-[2-(2-ethoxyethoxy)-3,3,3-trifluoro-2-(trifluoromethyl)propyl]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 370566-01-1

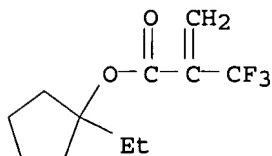
CMF C15 H20 F6 O2



CM 2

CRN 357294-14-5

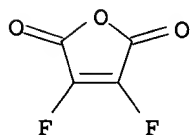
CMF C11 H15 F3 O2



CM 3

CRN 669-78-3

CMF C4 F2 O3



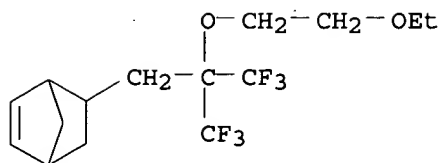
RN 370566-09-9 CAPLUS

CN 1H-Pyrrole-2,5-dione, 3,4-difluoro-1-methyl-, polymer with 5-[2-(2-ethoxyethoxy)-3,3,3-trifluoro-2-(trifluoromethyl)propyl]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 370566-01-1

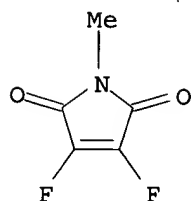
CMF C15 H20 F6 O2



CM 2

CRN 56154-82-6

CMF C5 H3 F2 N O2



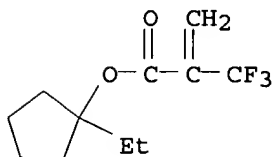
RN 370566-10-2 CAPLUS

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1-ethylcyclopentyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 3,4-difluoro-1-methyl-1H-pyrrole-2,5-dione (9CI) (CA INDEX NAME)

CM 1

CRN 357294-14-5

CMF C11 H15 F3 O2

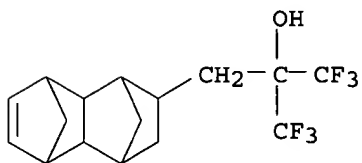


CM 2



L20 ANSWER 8 OF 8 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:747183 CAPLUS  
 DN 135:310922  
 TI **Photoresist resin** composition comprising novel  
 polysiloxane silicon-containing alicyclic compound  
 IN Iwasawa, Haruo; Shimokawa, Tsutomu; Akihiro, Hayashi; Nishiyama, Satoru  
 PA JSR Corporation, Japan  
 SO Eur. Pat. Appl., 109 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1142928	A1	20011010	EP 2001-108625	20010405
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2001288268	A2	20011016	JP 2000-107207	20000407
	JP 2002105086	A2	20020410	JP 2000-291089	20000925
	JP 2002128788	A2	20020509	JP 2000-318752	20001019
	US 2001041769	A1	20011115	US 2001-824224	20010403
	US 6531260	B2	20030311		
PRAI	JP 2000-107207	A	20000407		
	JP 2000-291089	A	20000925		
	JP 2000-318752	A	20001019		
AB	A novel polysiloxane having the structural units of the following formula I, II and III (A1, A2 = acid-dissociable monovalent org. group, R1 = H, monovalent (halogenated) hydrocarbon, halogen, amino, R2 = monovalent (halogenated) hydrocarbon group, halogen) is disclosed. A method of prepg. such a polysiloxane, a silicon-contg. alicyclic compd. providing this polysiloxane, and a radiation-sensitive <b>resin</b> compn. comprising this polysiloxane are also provided. The polysiloxane is useful as a <b>resin</b> component for a resist material, effectively senses radiation with a short wavelength (157-248 nm), exhibits high transparency to radiation and superior dry etching properties, and excels in basic resist properties required for resist materials such as high sensitivity, resolu., developability, etc.				
IT	<b>365533-00-2</b> RL: RCT (Reactant); RACT (Reactant or reagent) (in prepn. of silicon-contg. alicyclic compd.)				
RN	365533-00-2 CAPLUS				
CN	1,4:5,8-Dimethanonaphthalene-2-ethanol, 1,2,3,4,4a,5,8,8a-octahydro-.alpha.,.alpha.-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)				



RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

=>

US-PAT-NO: 6531260

DOCUMENT-IDENTIFIER: US 6531260 B2

TITLE: Polysiloxane, method of manufacturing same,  
silicon-containing alicyclic compound, and  
radiation-sensitive resin composition

----- KWIC -----

US Patent No. - PN (1):  
6531260

The present invention further provides a method of preparing a polysiloxane having the structural unit (I-1) and/or structural unit (II-1), shown above, and having a polystyrene-reduced weight average molecular weight determined by gel permeation chromatography (GPC) in the range of 500-1,000,000, the method comprising a step of polycondensing at least one component selected from the group consisting of the silicon-containing alicyclic compounds having the above-described formulas (2-A) or (2-B) or a linear or cyclic oligomer prepared by partial condensation of this silicon-containing alicyclic compound in the presence of an acidic catalyst.

The present invention further provides a method of preparing a polysiloxane having the structural unit (I-2) and/or structural unit (II-2), shown above, and having a polystyrene-reduced weight average molecular weight determined by gel permeation chromatography (GPC) in the range of 500-1,000,000, the method comprising a step of polycondensing at least one component selected from the group consisting of the silicon-containing alicyclic compounds having the above-described formulas (4-A) or (4-B) or a linear or cyclic oligomer prepared by partial condensation of this silicon-containing alicyclic compound in the presence of an acidic catalyst.

Other objects, features and advantages of the invention will hereinafter become more readily apparent from the following description.

#### DETAILED DESCRIPTION OF THE INVENTION AND PREFERRED EMBODIMENTS

The present invention will be described in more detail below.

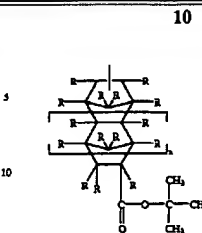
##### Polysiloxane (1)

Polysiloxane (1) has the structural unit (I) and/or structural unit (II) and structural unit (III), each having a formula shown above.

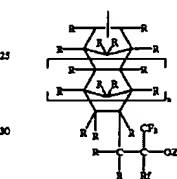
As the monovalent organic group, having an acid-dissociable group dissociable by the action of an acid, represented by A<sup>1</sup> and A<sup>2</sup> in the structural unit (I) and/or structural unit (II), groups which dissociate in the presence of an acid to produce a carboxyl group, phenolic hydroxyl group, or alcoholic hydroxyl group, and are stable under the reaction conditions for preparing the polysiloxane (1) can be given. As preferable specific examples, the groups shown by the following formula (9) (hereinafter referred to as "an acid-dissociable group (a)<sup>1</sup>"), the following formula (10) (hereinafter referred to as "an acid-dissociable group (a)<sup>2</sup>"), the following formula (11) (hereinafter referred to as "an acid-dissociable group (a)<sup>3</sup>"), and the like can be given.



wherein p indicates a single bond, methylene group, difluoromethylene group, alkylene group having 2-20 carbon atoms, fluoroalkylene group having 2-20 carbon atoms, divalent aromatic group having 6-20 carbon atoms, or divalent alicyclic group having 3-20 carbon atoms, O represents a group  $\text{---} \text{O} \text{---}$  or  $\text{---} \text{COO} \text{---}$ , and Z represents a monovalent organic group dissociating by the action of acid



wherein R individually represents a hydrogen atom or a methyl group and n is an integer of 0-3, the free bonding hands binding with the 2 or 3 position of the uppermost bicyclo[2.2.1] heptane ring.



wherein R individually represents a hydrogen atom or a methyl group, Rf represents a hydrogen atom, methyl group or trifluoromethyl group, Z represents a monovalent organic group dissociating by the action of acid to produce hydrogen atoms, and n is an integer of 0-3, the free bonding hands binding with the 2 or 3 position of the uppermost bicyclo[2.2.1] heptane ring.

As examples of the alkylene group having 2-20 carbon atoms represented by P in the acid-dissociable group (a)<sup>1</sup>, ethylene group, n-propylene group, 1-propylene group, n-butylene group, and the like can be given.

As examples of the fluoroalkylene group having 2-20 carbon atoms represented by P, a tetrafluoroethylene group, hexafluoro-n-propylene group, octafluoro-n-butylene group, and the like can be given.

As examples of the divalent aromatic group having 6-20 carbon atoms represented by P, a phenylene group, naphthylene group, perfluorophenylene group, perfluoronaphthylene group, and the like can be given.

As examples of the divalent alicyclic group having 3-20 carbon atoms represented by P, a divalent hydrocarbon group having a norbornene skeleton, tricyclodecane skeleton, or adamantane skeleton and a halide of such a hydrocarbon group can be given.

As the group P in the acid-dissociable group (a)<sup>1</sup>, a single bond, methylene group, difluoromethylene group, a divalent hydrocarbon group having a norbornene skeleton, its halide derivative, a divalent hydrocarbon group having an adamantane skeleton, its halide derivative, and the like are preferable.

As examples of the monovalent organic group dissociating a hydrogen atom by the action of an acid represented by

US-PAT-NO: 6468712

DOCUMENT-IDENTIFIER: US 6468712 B1

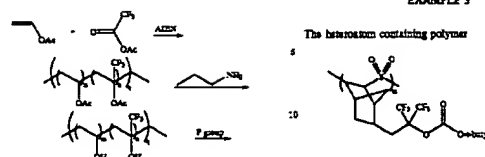
TITLE: Resist materials for 157-nm lithography

----- KWIC -----

US Patent No. - PN (1):

6468712

US 6,468,712 B1

16  
EXAMPLE 3

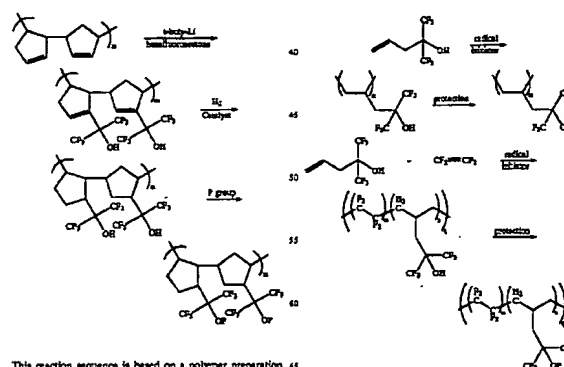
15 can be prepared by the method of H. Ito, N. Seckof, R. Sato, T. Nakayama and M. Ueda, *Microw. and Nanopatterning Polymers*, ACS Symposium Series 706, p. 208 (Ito et al., Eds. American Chemical Society, Washington, D.C. 1997).

EXAMPLE 4

This reaction sequence is based on a polymer preparation developed by Haas (H. C. Haas, and N. W. Schmitz, *J. Polym. Sci., Part A*, 2, p.1641 (1964), and H. C. Haas, R. L. MacDonald and C. E. Chisholm, *J. Polym. Sci., Part A*, 7, p. 633 (1969)

Reaction of allyl magnesium bromide Grignard reagent with hexafluoroacetone provides a useful unsaturated tertiary alcohol. The unsaturated alcohol can be polymerized and then protected, or protected and then polymerized. The unsaturated alcohol is useful as an intermediate in the following synthetic preparations to prepare a homopolymer or as a copolymer with isobutylacrylate, cyclopentadiene, or an allyl ether.

Polymerization of cyclopentadiene with hexafluoroacetone produces a polymer with tertiary hydroxyl groups. Hydrogenation of the sites of unsaturation followed by protection of the hydroxyl groups completes the synthesis as shown below.



This reaction sequence is based on a polymer preparation developed by H. Kwart and M. W. Bruchholz, *J. Org. Chem.* 47, p. 3353, (1982).

US-PAT-NO: 6503686

DOCUMENT-IDENTIFIER: US 6503686 B1

TITLE: Nitrile/fluoroalcohol-containing photoresists and associated processes for microlithography

----- KWIC -----

US Patent No. - PN (1):  
6503686

Typically the photoresist composition is further comprised of a solvent, and the process (as given supra) further comprises, between steps (A) and (B), a step of drying the photoresist composition to substantially remove solvent and thereby form a photoresist layer on the substrate.

With respect to some specific embodiments of the photoresists and associated processes of this invention, the polymer (nitrile/fluoroalcohol-containing polymer) present as a component in the photoresists preferably has an absorption coefficient of less than  $5.0 \mu\text{m}^{-1}$  at a wavelength of 157 nm. In other certain embodiments, the (nitrile/fluoroalcohol-containing) polymer is further comprised of protected acid groups and/or aliphatic polycyclic functionality. In some embodiment(s), the photoactive component of the photoresists and associated processes is a photoacid generator. In still other certain embodiment(s), the photoresists and associated processes are further comprised of a dissolution inhibitor.

#### DETAILED DESCRIPTION OF THE INVENTION

A key characteristic of the polymers (and photoresists comprised of the polymers) of this invention is the cooperative combination in the polymers of repeat unit(s) containing a fluoroalcohol functional group with repeat units containing the cyano (CN) group. Another characteristic of the polymer is that it lacks amounts of functionality sufficient to cause the polymer to detrimentally absorb in the extreme and far UV. The presence of repeat units containing fluoroalcohol functional groups is desirable in order for the polymers to be sufficiently acidic to be developable in basic aqueous media while at the same time minimizing the need for having alternate functionality, such as carboxylic acid, present for developability, which may lead to too high absorptions in the deep UV for these materials to be used in resists at these low imaging wavelengths (e.g., 157 nm or 193 nm). The presence of repeat units containing cyano (CN) functionality in these polymers is desirable in order for the polymers to possess high optical transparency, i.e., to have low optical absorptions in the extreme and far UV, and improved etch resistance, while at the same time providing polar functionality that significantly imparts increased developability to these polymers and affords suitable development characteristics with lower levels of fluoroalcohol functional groups than would otherwise, usually, be required. The minimization of functionality, such as aromatic groups, which absorb in the extreme ultraviolet in the repeat units of the polymers is desirable in order for these polymers to possess high optical transparency.

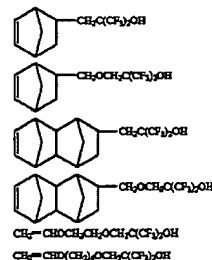
#### Nitrile/Fluoroalcohol-Containing Polymers

A given nitrile/fluoroalcohol-containing polymer comprising a repeat unit derived from at least one ethylenically unsaturated compound containing a fluoroalcohol functional group according to this invention has fluoroalkyl groups present as part of the fluoroalcohol functional group.

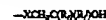
These fluoroalkyl groups are designated as  $R_f$  and  $R'_f$ , which can be partially fluorinated alkyl groups or fully fluorinated alkyl groups (i.e., perfluoroalkyl groups). The groups designated by  $R_f$  and  $R'_f$  are the same or different fluoroalkyl groups of from 1 to about 10 carbon atoms or, taken together, are  $(\text{CF}_3)_n$ , wherein  $n$  is 2 to about 10. The terms "taken together" mean that  $R_f$  and  $R'_f$  are not separate, discrete fluorinated alkyl groups, instead together they form a ring structure such as is illustrated below in the case of a



$R_f$  and  $R'_f$  can be partially fluorinated alkyl groups without limit according to the invention except that there must be a sufficient degree of fluorination present to impart acidity to the hydroxyl ( $-\text{OH}$ ) of the fluoroalcohol functional group such that the hydroxyl proton is substantially removed in basic media, such as in aqueous sodium hydroxide solution or tetraalkylammonium hydroxide solution. According to the invention, there will usually be sufficient fluorine substitution present in the fluorinated alkyl groups of the fluoroalcohol functional group such that the hydroxyl group will have a  $\text{pK}_a$  value of less than or equal to about 11. In preferred cases according to the invention, there will be sufficient fluorine substitution present in the fluorinated alkyl groups of the fluoroalcohol functional group such that the hydroxyl group will have a  $\text{pK}_a$  value between about 4 and about 11. More preferably,  $R_f$  and  $R'_f$  are independently perfluoroalkyl groups of 1 to 5 carbon atoms, and, more preferably,  $R_f$  and  $R'_f$  are both trifluoromethyl  $(\text{CF}_3)_n$  groups. Some illustrative, but nonlimiting, examples of monomers falling within the generalized structural formula (given supra) containing a fluoroalcohol functional group and within the scope of the invention are presented below:



For a particular embodiment of the invention, the fluoroalcohol functional group has the structure:



wherein  $R_f$  and  $R'_f$  are the same or different fluoroalkyl groups of from 1 to about 10 carbon atoms or taken together are  $(\text{CF}_3)_n$ , wherein  $n$  is 2 to about 10; X is selected from the group consisting of oxygen atom, sulfur atom, nitrogen atom, phosphorus atom, other Group VB element, and other Group VIB element (Sargent Welch Periodic Table, 1979, Sargent Welch Scientific Company, Skokie, Ill.). The terms "other Group VA element" and "other Group VIA element" are understood to mean any other element in one of these groups of the periodic table that is other than the recited elements (i.e., oxygen, sulfur, nitrogen, phosphorus) in these groups. Oxygen is the preferred group.

At least a portion of the nitrile functionality that is present

Details Text Image HTML KWIC

Details Text Image HTML Full

L27 ANSWER 78 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:636379 CAPLUS  
 DN 135:218727  
 TI Resist materials for 157-nm lithography  
 IN Fedynyshyn, Theodore H.  
 PA Massachusetts Institute of Technology, Inc., USA  
 SO PCT Int. Appl., 43 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001063362	A2	20010830	WO 2001-US5907	20010226
	WO 2001063362	A3	20020307		
	W: CA, JP				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
	US 6468712	B1	20021022	US 2000-513792	20000225
	EP 1257880	A2	20021120	EP 2001-911149	20010226
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
PRAI	US 2000-513792	A	20000225		
	WO 2001-US5907	W	20010226		

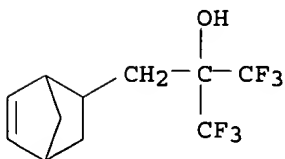
AB The invention relates to **photoresist** materials useful in microlithog. and to improved materials and methods for pattern formation on semiconductor wafers. A radiation sensitive **resin** compn. including a photo-acid generator and an aliph. **polymer** having .gtoreq.1 electron withdrawing groups adjacent to or attached to a C atom bearing a protected hydroxyl group, wherein the protecting group is labile in the presence of in situ generated acid is described. The radiation sensitive **resin** compn. can be used as a resist suitable for image transfer by plasma etching and enable 1 to obtain an etching image having high precision with high reproducibility with a high degree of resolu. and selectivity.

IT 357397-06-9D, functional-group protected 357397-07-0D, functional-group protected 357397-08-1D, functional-group protected 357397-09-2D, functional-group protected  
 RL: DEV (Device component use); POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)  
 (pos. **photoresist** compn. for 157-nm lithog. using)

RN 357397-06-9 CAPLUS  
 CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

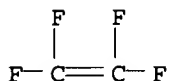
CRN 196314-61-1  
 CMF C11 H12 F6 O



CM 2

CRN 116-14-3

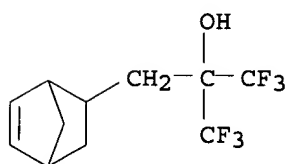
CMF C2 F4



RN 357397-07-0 CAPLUS  
CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

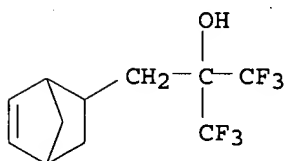
CRN 196314-61-1  
CMF C11 H12 F6 O



RN 357397-08-1 CAPLUS  
CN 2-Propenoic acid, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

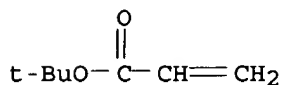
CM 1

CRN 196314-61-1  
CMF C11 H12 F6 O



CM 2

CRN 1663-39-4  
CMF C7 H12 O2

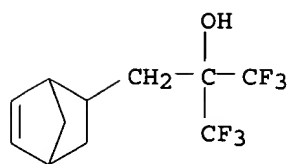


RN 357397-09-2 CAPLUS  
CN 2,5-Furandione, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

CM 1

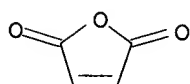
CRN 196314-61-1

CMF C11 H12 F6 O



CM 2

CRN 108-31-6  
CMF C4 H2 O3



L27 ANSWER 79 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN  
AN

2001:380920 CAPLUS

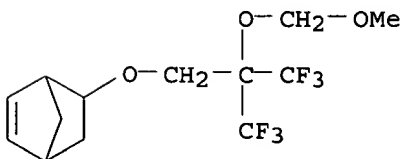
DN 134:359532  
TI Nitrile/fluoroalcohol-containing photoresists and associated processes for microlithography  
IN Fryd, Michael; Schadt, Frank Leonard, III; Periyasamy, Mookkan  
PA E.I. Du Pont De Nemours and Company, USA  
SO PCT Int. Appl., 40 pp.  
CODEN: PIXXD2  
DT Patent  
LA English  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001037047	A2	20010525	WO 2000-US31136	20001114
	WO 2001037047	A3	20020328		
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	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
	EP 1240554	A2	20020918	EP 2000-978579	20001114
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR			
	US 6503686	B1	20030107	US 2000-714782	20001116
PRAI	US 1999-166035P	P	19991117		
	WO 2000-US31136	W	20001114		
AB	The invention pertains to photoimaging and use of photoresists (pos.- and neg.-working) for imaging in the prodn. of semiconductor devices and to photoresists contg. <b>polymer</b> compns. having high UV transparency, particularly at short wavelengths, e. g., 157 nm or 193 nm, that are useful as base resins in resists and potentially, in many other applications. Nitrile/fluoroalc.-contg. photoresists and assocd. processes for microlithog. are described. These photoresists are comprised of a fluoroalc. functional group and a nitrile-contg. compd. which together simultaneously impart high UV transparency and development in basic media to these materials. The materials have high UV transparency, particularly at short wavelengths, e.g., 157 nm, which makes them highly useful for lithog. at these short wavelengths.				
IT	339265-99-5P 339266-00-1P 339266-01-2P RL: NUU (Other use, unclassified); PNU (Preparation, unclassified); POF (Polymer in formulation); PREP (Preparation); USES (Uses) (prepn. of polymers for nitrile/fluoroalc.-contg. compns. for photoresists having high UV transparency)				
RN	339265-99-5 CAPLUS				
CN	2-Propenoic acid, 2-methyl-, polymer with 2-propenenitrile and 5-[3,3,3-trifluoro-2-(methoxymethoxy)-2-(trifluoromethyl)propoxy]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)				

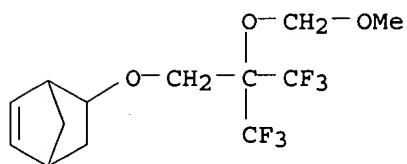
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CRN 305815-64-9

CMF C13 H16 F6 O3







CM 2

CRN 107-13-1

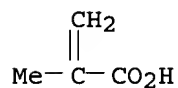
CMF C3 H3 N



CM 3

CRN 79-41-4

CMF C4 H6 O2



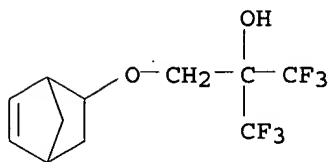
RN 339266-00-1 CAPLUS

CN 2-Propenoic acid, 2-methyl-, 1,1-dimethylethyl ester, polymer with 2-[(bicyclo[2.2.1]hept-5-en-2-yloxy)methyl]-1,1,1,3,3,3-hexafluoro-2-propanol and 2-propenenitrile (9CI) (CA INDEX NAME)

CM 1

CRN 305815-63-8

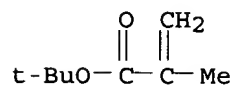
CMF C11 H12 F6 O2



CM 2

CRN 585-07-9

CMF C8 H14 O2



CM 3

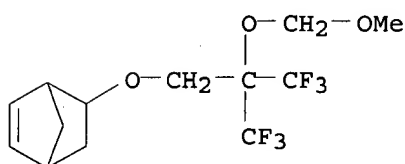
CRN 107-13-1  
CMF C3 H3 N



RN 339266-01-2 CAPLUS  
CN 2-Propenoic acid, 2-methyl-, polymer with 1,1-dimethylethyl  
2-methyl-2-propenoate, 2-propenenitrile and 5-[3,3,3-trifluoro-2-  
(methoxymethoxy)-2-(trifluoromethyl)propoxy]bicyclo[2.2.1]hept-2-ene (9CI)  
(CA INDEX NAME)

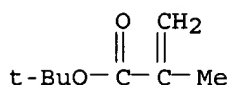
CM 1

CRN 305815-64-9  
CMF C13 H16 F6 O3



CM 2

CRN 585-07-9  
CMF C8 H14 O2



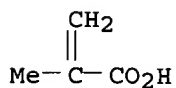
CM 3

CRN 107-13-1  
CMF C3 H3 N



CM 4

CRN 79-41-4  
CMF C4 H6 O2

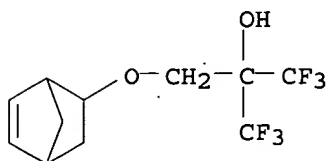


IT 305815-63-8P 305815-64-9P  
RL: NUU (Other use, unclassified); RCT (Reactant); SPN (Synthetic  
preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

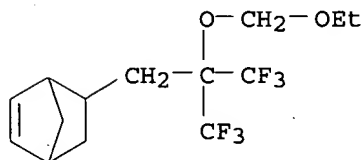
(prepn. of, for nitrile/fluoroalc.-contg. **polymer** compns. for  
photoresists having high UV transparency)

RN 305815-63-8 CAPLUS

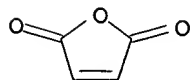
CN 2-Propanol, 2-[(bicyclo[2.2.1]hept-5-en-2-yloxy)methyl]-1,1,1,3,3,3-  
hexafluoro- (9CI) (CA INDEX NAME)



L27 ANSWER 84 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2000:806346 CAPLUS  
 DN 134:200397  
 TI Polymers for 157-nm **photoresist** applications: a progress report  
 AU Patterson, Kyle; Yamachika, Miko; Hung, Raymond J.; Brodsky, Colin J.;  
 Yamada, Shintaro; Somervell, Mark H.; Osborn, Brian; Hall, Daniel;  
 Dukovic, Gordana; Byers, Jeffrey; Conley, Willard; Willson, C. Grant  
 CS Dep. Chemistry and Chem. Eng., The Univ. Texas at Austin, Austin, TX, USA  
 SO Proceedings of SPIE-The International Society for Optical Engineering  
 (2000), 3999(Pt. 1, Advances in Resist Technology and Processing XVII),  
 365-374  
 CODEN: PSISDG; ISSN: 0277-786X  
 PB SPIE-The International Society for Optical Engineering  
 DT Journal  
 LA English  
 AB Finding materials that offer the all of the characteristics required of  
**photoresist** matrix **resin** polymers while trying to  
 maintain a high level of transparency at 157 nm is a daunting challenge.  
 To simplify this task, the authors have broken the design of these  
 polymers down into subunits, each of which was responsible for a required  
 function in the final material. In addn., the authors have begun  
 collecting gas-phase VUV spectra of these potential subunits to measure  
 their individual absorbance contributions. Progress on developing  
 materials for each of these subunits were presented along with plans for  
 future studies.  
 IT **328114-62-1**  
 RL: PRP (Properties); TEM (Technical or engineered material use); USES  
 (Uses)  
 (model **polymer**; design of polymers and their subunits for  
 157-nm **photoresist** applications)  
 RN 328114-62-1 CAPLUS  
 CN 2,5-Furandione, polymer with 5-[2-(ethoxymethoxy)-3,3,3-trifluoro-2-  
 (trifluoromethyl)propyl]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 328114-61-0  
 CMF C14 H18 F6 O2

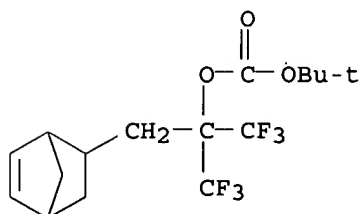


CM 2  
 CRN 108-31-6  
 CMF C4 H2 O3



RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L27 ANSWER 85 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2000:806336 CAPLUS  
 DN 134:214824  
 TI Using alicyclic polymers in top surface imaging systems to reduce line-edge roughness  
 AU Somervell, Mark H.; Fryer, David S.; Osborn, Brian; Patterson, Kyle; Cho, Sungseo; Byers, Jeffrey D.; Willson, C. Grant  
 CS Univ. of Texas at Austin, Dallas, TX, USA  
 SO Proceedings of SPIE-The International Society for Optical Engineering (2000), 3999(Pt. 1, Advances in Resist Technology and Processing XVII), 270-282  
 CODEN: PSISDG; ISSN: 0277-786X  
 PB SPIE-The International Society for Optical Engineering  
 DT Journal  
 LA English  
 AB Top surface imaging (TSI) systems based on vapor phase silylation have been investigated for use at a variety of wavelengths. This approach to generating high aspect ratio, high resolu. images held great promise particularly for 193 nm and extreme-UV lithog. applications. Several 193 nm TSI systems have been described that produce very high resolu. (low k factor) images with wide process latitude. However, because of the line edge roughness assocd. with the final images, TSI systems have fallen from favor. In fact, top surface imaging and line edge roughness have become synonymous in the minds of most. Most of the 193 nm TSI systems are based on poly(p-hydroxystyrene) resins. These polymers have an unfortunate combination of properties that limit their utility in this application. These limiting properties include (1) high optical d., (2) poor silylation contrast, and (3) low glass transition temp. of the silylated material. These shortcomings are related to inherent **polymer** characteristics and are responsible for the pronounced line edge roughness in the poly(p-hydroxystyrene) systems. The authors synthesized certain alicyclic polymers that have higher transparency and higher glass transition temps. Using these polymers, the authors demonstrated the ability to print high resolu. features with very smooth sidewalls. This paper describe the synthesis and characterization of the polymers and their application to top surface imaging at 193 nm. The anal. that was used to tailor the processing and the **polymer's** phys. properties to achieve optimum imaging is also described.  
 IT 214079-69-3  
 RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)  
 (lithog. performance of alicyclic-**polymer** based chem. amplified photoresists in top surface imaging for redn. of line-edge roughness)  
 RN 214079-69-3 CAPLUS  
 CN Carbonic acid, 1-(bicyclo[2.2.1]hept-5-en-2-ylmethyl)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl 1,1-dimethylethyl ester, polymer with sulfur dioxide, alternating (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 196314-63-3  
 CMF C16 H20 F6 O3



CM 2

CRN 7446-09-5

CMF 02 S

O=S=O

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L27 ANSWER 86 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:806316 CAPLUS

DN 134:200382

TI Negative-tone 193-nm resists

AU Cho, Sungseo; Vander Heyden, Anthony; Byers, Jeffrey D.; Willson, C. Grant  
CS Univ. of Texas at Austin, Austin, TX, USA

SO Proceedings of SPIE-The International Society for Optical Engineering  
(2000), 3999(Pt. 1, Advances in Resist Technology and Processing XVII),  
62-73

CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

AB A great deal of progress has been made in the design of single layer pos.  
tone resists for 193 nm lithog. Com. samples of such materials are now  
available from many vendors. The patterning of certain levels of devices  
profits from the use of neg. tone resists. There have been several  
reports of work directed toward the design of neg. tones resists for 193  
nm exposure but, none have performed as well as the pos. tone systems.  
Polymers with alicyclic structures in the backbone have emerged as  
excellent platforms from which to design pos. tone resists for 193 nm  
exposure. The authors report the adaptation of this class of polymers to  
the design of high performance neg. tone 193 nm resists. New systems have  
been prepd. that are based on a polarity switch mechanism for modulation  
of the dissoln. rate. The systems are based on a polar, alicyclic  
**polymer** backbone that includes a monomer bearing a glycol pendant  
group that undergoes the acid catalyzed pinacol rearrangement upon  
exposure and bake to produce the corresponding less polar ketone. This  
monomer was copolymd. with maleic anhydride and a norbornene bearing a  
bis-trifluoromethylcarbinol. The rearrangement of the **copolymer**  
was monitored by FT-IR as a function of temp. The synthesis of the  
norbornene monomers will be presented together with characterization of  
copolymers of these monomers with maleic anhydride. The lithog.  
performance of the new resist system will also be presented.

IT 327610-81-1P

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or  
engineered material use); PREP (Preparation); USES (Uses)

(**photoresist** for 193 nm lithog. contg. terpolymer of maleic  
anhydride and norbornene with bis-trifluoromethylcarbinol and  
norbornene with glycol pendant group that undergoes acid catalyzed  
pinacol rearrangement)

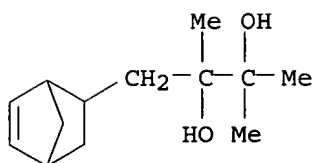
RN 327610-81-1 CAPLUS

CN 2,5-Furandione, polymer with 1-bicyclo[2.2.1]hept-5-en-2-yl-2,3-dimethyl-  
2,3-butanediol and .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-  
5-ene-2-ethanol (9CI) (CA INDEX NAME)

CM 1

CRN 327610-80-0

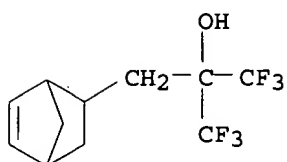
CMF C13 H22 O2



CM 2

CRN 196314-61-1

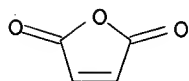
CMF C11 H12 F6 O



CM 3

CRN 108-31-6

CMF C4 H2 O3



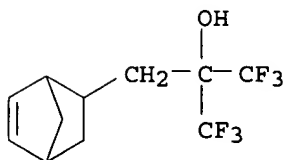
IT 196314-61-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(polymn. with maleic anhydride and (dihydroxydimethylbutyl)bicyclo[2.2.1]heptene in synthesis of **polymer** photoresists for 193 nm lithog.)

RN 196314-61-1 CAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-(9CI) (CA INDEX NAME)



RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L27 ANSWER 87 OF 89 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:790750 CAPLUS

DN 133:357252

TI Fluorinated polymers, photoresists and processes for microlithography

IN Feiring, Andrew Edward; Feldman, Jerald

PA E.I. Du Pont De Nemours and Company, USA

SO PCT Int. Appl., 69 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 FAN.CNT 1

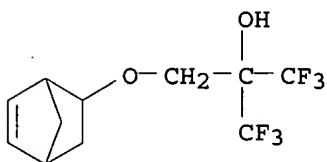
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000067072	A1	20001109	WO 2000-US11539	20000428
	W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	EP 1183571	A1	20020306	EP 2000-928563	20000428
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2002543469	T2	20021217	JP 2000-615852	20000428
PRAI	US 1999-132373P	P	19990504		
	WO 2000-US11539	W	20000428		

AB Fluorinated polymers, photoresists and assocd. processes for microlithog. are described. These polymers and photoresists are comprised of a fluoroalc. functional group which simultaneously imparts high UV transparency and developability in basic media to these materials. The materials of this invention have high UV transparency, particularly at short wavelengths, e.g. 157 nm, which makes them highly useful for lithog. at these short wavelengths.

IT **305815-63-8P 305815-64-9P**  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (fluorinated polymers, photoresists and processes for microlithog.)

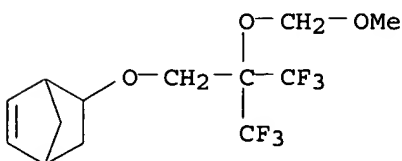
RN 305815-63-8 CAPLUS

CN 2-Propanol, 2-[(bicyclo[2.2.1]hept-5-en-2-yloxy)methyl]-1,1,1,3,3,3-hexafluoro- (9CI) (CA INDEX NAME)



RN 305815-64-9 CAPLUS

CN Bicyclo[2.2.1]hept-2-ene, 5-[3,3,3-trifluoro-2-(methoxymethoxy)-2-(trifluoromethyl)propoxy]- (9CI) (CA INDEX NAME)



IT **305815-68-3P 305815-71-8P 305815-78-5P**

RL: SPN (Synthetic preparation); PREP (Preparation)

(fluorinated polymers, photoresists and processes for microlithog.)

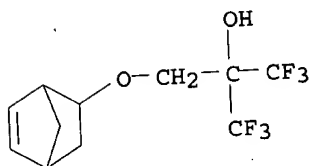
RN 305815-68-3 CAPLUS



CN 2-Propanol, 2-[(bicyclo[2.2.1]hept-5-en-2-yloxy)methyl]-1,1,1,3,3,3-hexafluoro-, polymer with bicyclo[2.2.1]hept-2-ene and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 305815-63-8  
CMF C11 H12 F6 O2



CM 2

CRN 498-66-8  
CMF C7 H10

